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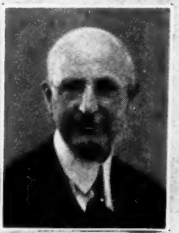

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Partial Denture Prosthesis

Orthodontia and Periodontia

THE JOURNAL
OF THE
American Dental Association

VOL. 10 JULY, 1923 NO. 7

Original Communications

ARCH PREDETERMINATION—IS IT PRACTICAL?

By WILLIAM H. GILPATRIC, D.M.D., Boston, Massachusetts

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)

IN THE presentation of a subject which has been so generally discussed, it seems to me that time is one of the important factors in determining its ultimate success or failure, and this naturally leads us to a brief resume of its history.

This history is naturally the result of the combined efforts of various men working toward an ideal, so in the predetermination of the arch, investigations of Bonwill, Hawley, Stanton and other men have contributed their share in the evolution of this important subject.

Bonwill was the pioneer in arch predetermination, but his application was made in relation to prosthetic dentistry. It remained, however, for Hawley to adopt the principles of Bonwill and apply them to the orthodontic field. In 1904 Hawley[1] presented a paper on "The Determination of the Dental Arch and its Application to Orthodontia."

The work of these men aroused in others a recognition of the need for a definite standard from which to work, and inspired the writer to work on and produce what he considers a practical application of arch predetermination.

The present survey had its beginning in sets of artificial teeth placed on arches anatomically corresponding to averages, obtained from arches able to contain and support the definite number of teeth of a definite tooth substance. From these definite measurements, a set of normal arches was designed ranging from 74½ mms. tooth substance, and increasing one millimeter between arches up to and including 100½ mms. tooth substance (measured from the buccal groove of the six-year molar around to the buccal groove of the corresponding six-year molar) on the upper arch, with

[1]Hawley, C. A., *Dental Cosmos*, Vol. XLVII, No. 5, p. 541.

corresponding lower arches which we have designed as "normal orthodontographic arches." What is a normal

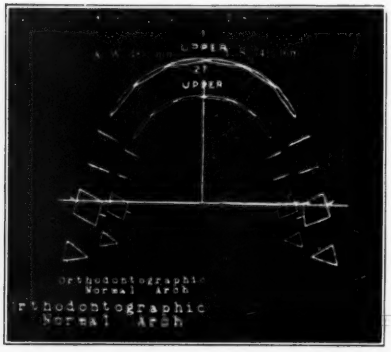
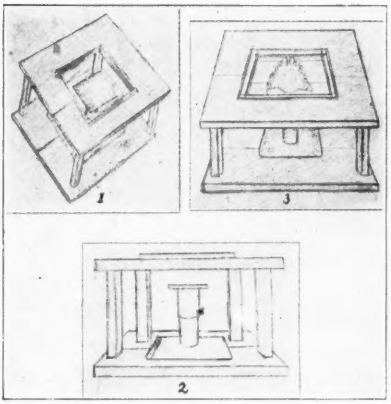


Fig. A

orthodontographic arch? A normal orthodontographic arch is a standard from which to work and to compare the malformed arch.

Figure A. The inside line (a) represents the arch for 74½ mms.; outside, 100½ mms. tooth substance. We have found in our practical work that between these sizes are contained all of the tooth substance on upper found in over 5,000 cases with one exception which had 68½ mms. In 90 per cent of our cases, we have found the tooth substance to be between 82½ and 89½ mms.



Figs. 1, 2 and 3

With this material at hand, means to obtain surveys of these arches were devised, resulting in an orthodontic surveying machine, an instrument with which the position of teeth in an arch may be definitely drawn.

The apparatus consists of a mahogany table on which is mounted an adjusting leveling table so as to bring the model up to a glass 3¼ by 4 inches and 1

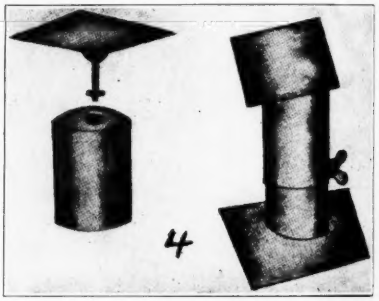


Fig. 4

mm. thick. One side has a fine silk finish, which takes the registration points of a pencil; this glass is attached to the upper table. (Mineral oil is used on the glass to make it transparent. Fig. 1, 2, 3 and 4).

The first step in making an orthodontographic survey is as follows:

1. Get a good model (plaster impression preferred). For measuring the teeth we have found compound impressions best. By taking them in three sections (one section of each side and one of the six anterior teeth) they will not draw and there is less danger of breaking at contact points as with plaster.

2. Register the cusps of molars and bicuspids—contact points of the molars,

bicuspids, and the six anterior teeth—and get the median line from mouth and register on model.

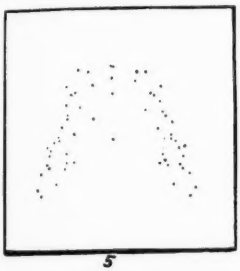


Fig. 5

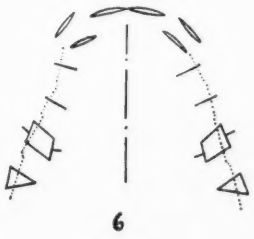


Fig. 6

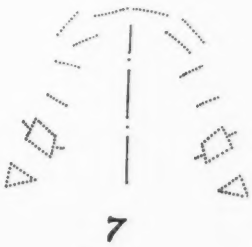


Fig. 7

To Find the Relationship of the Upper Incisor Median Line to the Sagittal Plane of the Skull.

Mark the glabella (the mid-point between the eyebrows) with a lead pencil. Standing directly in front of patient,

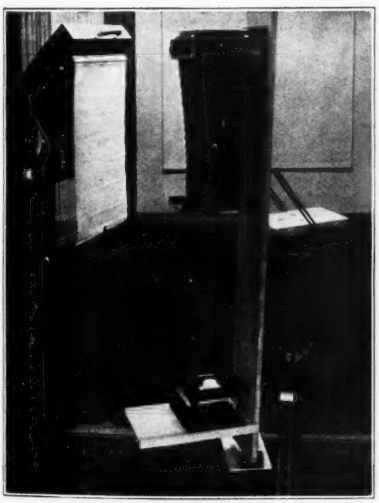


Fig. C

who is seated with head thrown back and mouth open, hold a fine wire vertically in front of the patient's nose. Close one eye and register the wire on the glabella and on two points of the palatine suture; holding it thus, shift the eye and note where the wire crosses the upper incisors. If it crosses at the incisor meeting line, your observation is

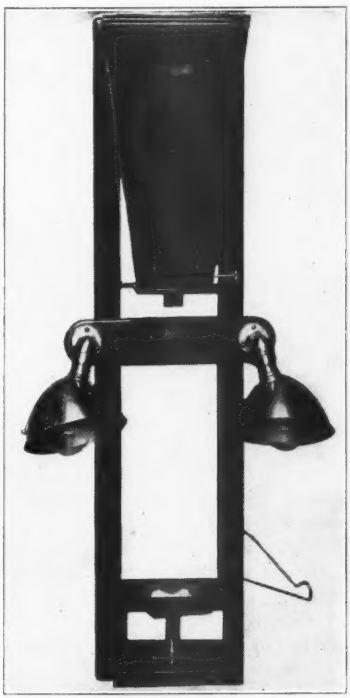


Fig. CC

complete, because the two coincide. If it crosses to either side of the incisor median, mark the point with the pencil on the incisor. Then repeat the observation and confirm this mark. Measure the deviation to be transferred to the models.

After this is carefully done, place model in apparatus, and while standing directly over it, register these points on the glass slide. (In registering the cusps and contact points, use one eye the same as when using the microscope).

Remove glass, place it upon tracing board, use a very thin transparent tracing cloth held firmly over the glass, register the points on cloth, and you will have the result as shown in Figure 5.

Figure 6 shows the teeth (anterior) drawn in, contact points of molars and bicuspids and cusp points of molars and bicuspids. Figure 7 shows the contact points and cusp points dotted.

Description of Camera

While this method is entirely satisfactory, and is in use at our office at the present time, our experience with the camera led us to combine it with the orthodontographic surveying machine and produce what we call the "Photographic Survey." Instead of using ground glass, we had a set of arches made on plain glass, whereby the malformed arch and normal arch could be photographed upon the same plate. Figure C shows the first camera outfit.

The Anastigmatic lens is the most desirable owing to the fact that it works on a greater field and has a greater depth of focus. The camera must be focused to get the exact size of model and arch, and it is necessary to have

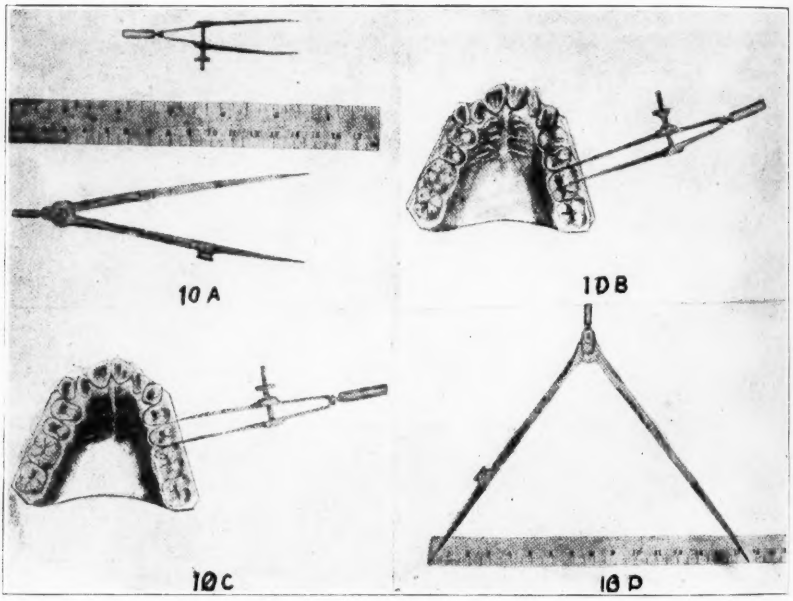


Fig. 10

the lighting above the lense and close to the bellows. We have found the Cooper Hewitt Mercury light the best, both for models and patients, although we are experimenting with the day-light bulbs.

Figure CC shows our latest camera. The bellows are solid and have a fixed focus. This method simplifies the technic and enables the assistant to do the work, thereby saving the operator's time. The surveying table is removed, model adjusted and placed on stand and brought up to the automatic focusing stop. The exposure is only five seconds.

The time consumed in measuring tooth substance and surveying is approximately twenty minutes.

Description of Instruments

Figure 10A represents all the instruments necessary to perform the work. They are a pair of big dividers, a pair of small dividers, a millimeter steel rule, and Faber's stenographic pencil No. 596. Excelsior tracing cloth is used for the tracings.

With small dividers (Fig. 10B) measure the distance from occlusal side of buccal groove of first molar to contact point with the second bicuspid(as shown in Figure 10B).

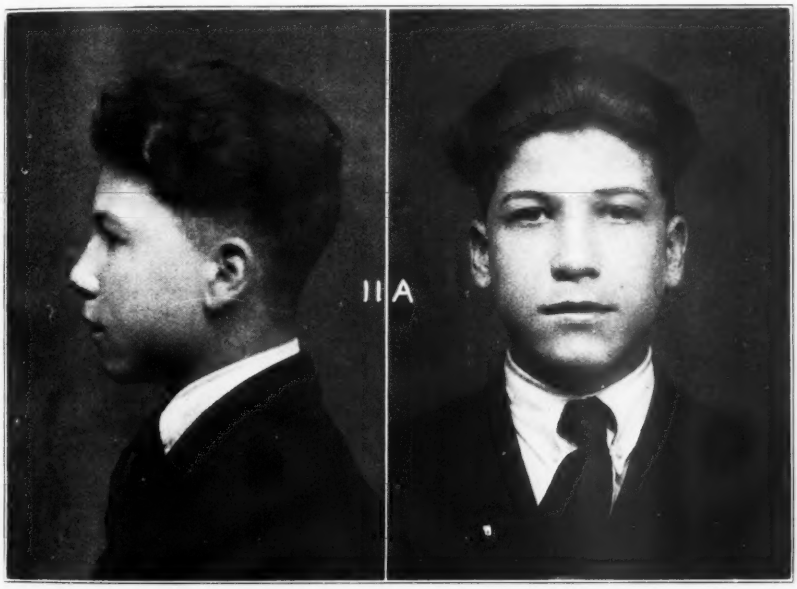


Fig. 11A

Transfer this measurement by pressing the points of dividers into heavy white paper. Next measure the second bicuspid from contact point to contact point as illustrated in Figure 12C. Transfer the measurement to paper, continuing from the points obtained from the molar. Figure 10B also shows registration marks on cusps and contact point. Now follow the procedure for the rest of the teeth, that is measure from contact point to contact point and transfer to paper, having one foot of

the divider in a previous made mark and the other foot making the new mark, obtaining in this manner one continuous measurement. The opposite first molar is measured in the same manner as the previous molar. This concludes the measurements of the individual teeth.

Figure 10D shows the big dividers transferring the total measurement previously obtained to the steel rule. In mixed denture measure all permanent teeth present, and to their total, add the total given of the missing teeth, taking the average measurement as given by Black.

Figure 11 illustrates the case of a boy, fourteen years of age with ovoid face. Figure 11B is a case of a boy thirteen years of age with tapering face. According to the prosthetist one should have a broad, short tooth, the other a long narrow tooth, but you can see from the models that this is not the case. One would naturally expect a large tooth substance on Figure 11A and the reverse on Figure 12B but, as a matter of fact, both boys have less than the average tooth substance. Figure 11A has 81½ mms. tooth substance and Figure 12B 72½ mms. tooth substance.

Fig. 11B

Figure 11C illustrates an ovoid face-occlusion; Figure 11D, tapering face-occlusion; Figure 11E ovoid, upper and lower occlusal view; Figure 11F tapering upper and lower occlusal view; Figure 11G, ovoid; Figure 11H, tapering upper and lower occlusal view with the normal orthodontographic arches superimposed.

Although these are two distinct types of arches, this demonstration proves conclusively that we can predetermine with accuracy any type. To those who

might criticize the fact that these are selected cases, I will admit that they are selected-chosen because of their distinctive types. They are only, however, two of a large number which I have collected during my study of this subject, all of which I have been able to predetermine according to this method.

We will now see how the arches will work out in practical orthodontic treatment.

Figure 12A shows the occlusion of the case of a girl eight years of age with constricted upper and lower arches, upper laterals not fully erupted and rotated (neutroclusion).

Figure 12B shows surveys of the upper and lower arches. If you will note we have for measurement the six year molars, the centrals and the two laterals, their combined width is 40.3 mms. plus the four unerupted bicuspids and two cuspids equaling 43.2

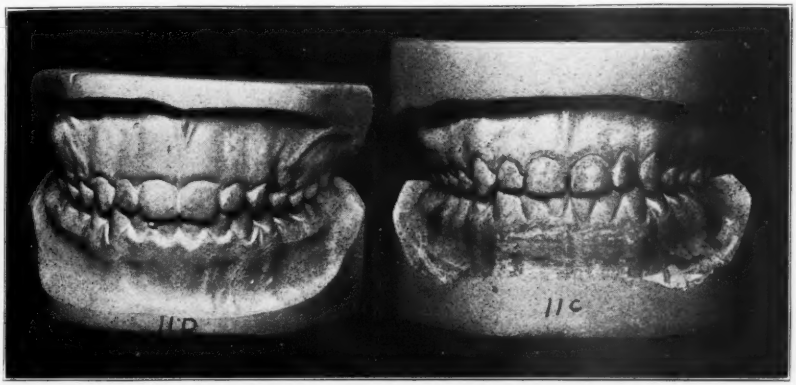


Fig. 11D Fig. 11C

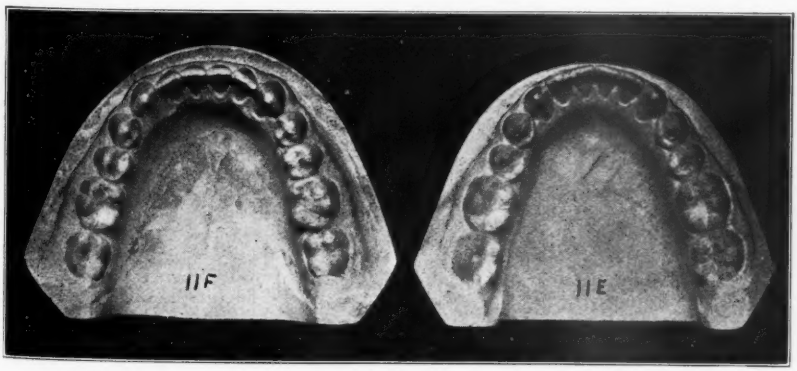


Fig. 11F Fig. 11E

mms. making the upper arch tooth substance 83½ mms. and the arch width 54¼ mms. How was the tooth substance of the missing teeth determined?

If you will note on the lower survey that in superimposing the lower normal arch it has been moved about 4 millimeters forward from the buccal groove

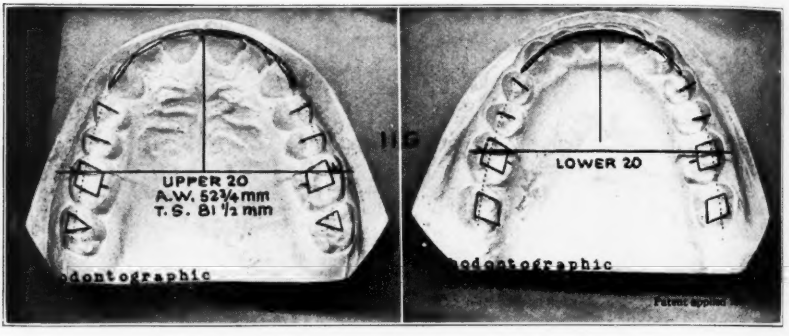


Fig. 11G

The figures were taken from Black's table of averages which is as follows:

BLACK'S TABLE OF AVERAGES

	Upper	Lower
Central	9.0	5.4
Lateral	6.4	5.9
Cuspid	7.6	6.9
First Bicuspid	7.2	6.9
Second Bicuspid	6.8	7.1
First Molar	10.7	11.2
Average arch	84.7	75.6

of the first molar. This is to compensate for the forward movement of the lower first molars upon the loss of the premolars. The reason for using the buccal groove of the first molar for the starting point is due to the fact that it is the most constant fixed point and establishes a base line upon which to work.

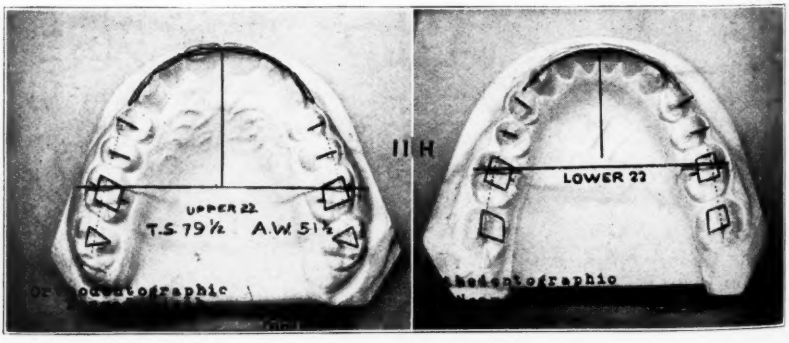


Fig. 11H

You will note by the surveys upon the upper that the laterals were making an effort to erupt in their proper posi-

tions, the centrals were in lingual version, and the lateral maxillary divisions required lateral development. Figure BB is an illustration of symbols.

may be revised from time to time as the case progresses.

Figure 12C shows the development which has taken place, and how closely

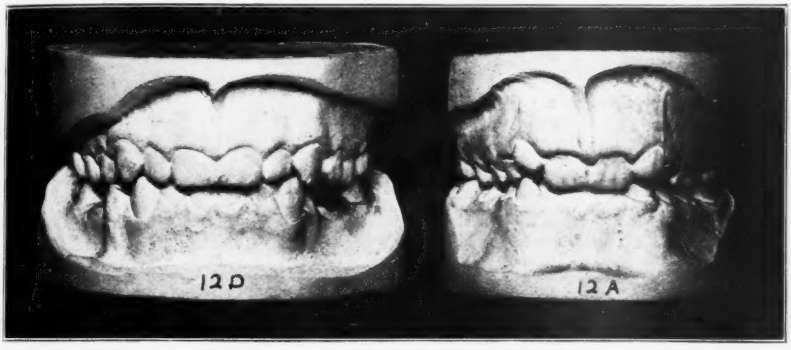


Fig. 12D Fig. 12A

The busy operator cannot be expected to carry all of the details of each case in his mind, so in working with the celluloid arches it occurred to me that it is possible to have arch diagrams and designate the direction in which each

we approximated the predetermined arch. You will note that the premolars and temporary cuspids have been lost, and that the bicuspids and cuspids have erupted. Since the loss of the temporary teeth we have remeasured the tooth sub-

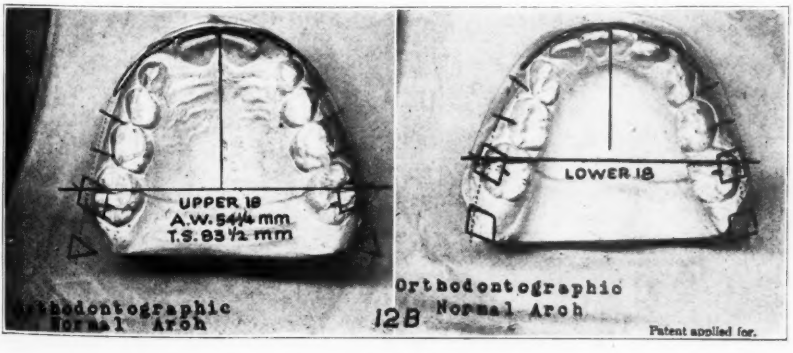


Fig. 12B

tooth should be moved. With this in mind I have produced for your criticism the above symbols. These are very useful for the associate as it may be seen at a glance what is being done. They

stance and found that it coincided with the original measurement.

Figure 12D shows the occluded upper and lower. Please note the overbite as compared to Figure 12A. The lower

second premolars have just been lost and the second bicuspid has not taken its place as yet.

Figure 13A shows a boy eight years

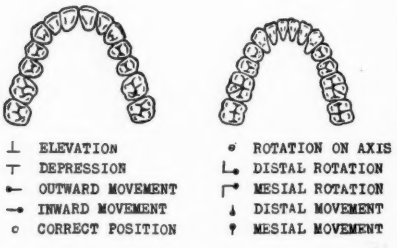


Fig. BB

of age with six year molars and centrals partially erupted. (Neutroclusion). You will note the shifting of the median line towards the right.

Figure 13B, tooth substance, 86½ mms., arch width 56¼ mms. The survey shows that the greater movement is required upon the upper right side. In Figure 13C, upon the lower, the greater movement is required on the left side. Note the bunching of the anterior teeth.

Figure 13D shows the upper movement to date. Figure 13E shows the lower movement to date. Note change of anterior teeth (upper and lower) without

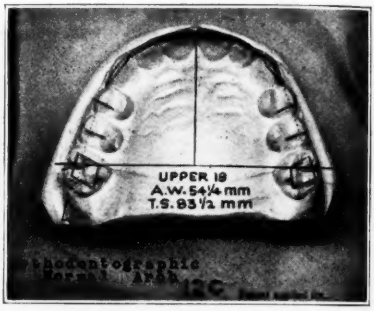


Fig. 12C

any attempt being made to move them—showing what nature will do if given an opportunity.

Figure 13F shows the change in

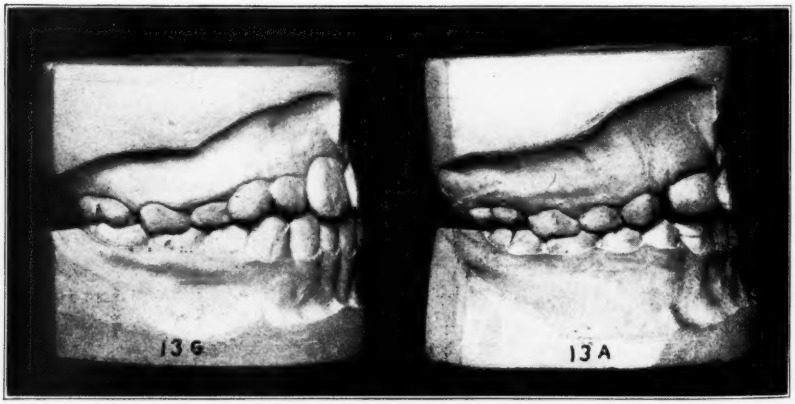


Fig. 13G

Fig. 13A

median line which has been brought about by moving the lateral maxillary divisions as indicated by the survey. Figure 13G shows the occlusal side with neutroclusion. One of the advantages of the survey is that it makes it possible

for us to produce symmetry of arches and to prevent drifting to distoclusion.

Figure 14A shows models of a boy eleven years of age with mixed dentures.

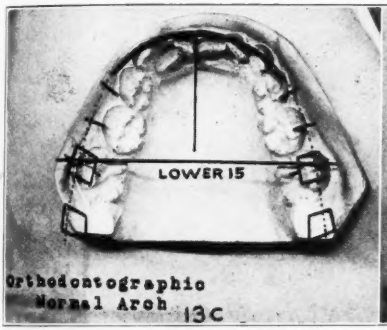


Fig. 13C

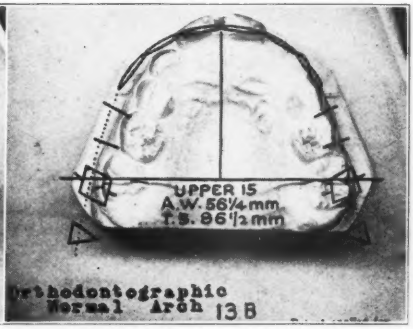


Fig. 13B

Figure 14C is a survey of the same case. Upper arch shows 89½ mms. tooth substance and arch width, 58¼ mms. Note the presence of the second premolars which prevented the first bicuspids from erupting in their proper positions. These were extracted and the first bicuspids moved back. Note that the upper left cuspid which was apparently erupting outside the arch is shown by the survey to be in its proper position buccally, but requiring distal movement.

Figure 14D shows lower of the same case. Note molars tipping lingually. Radiographs taken of the lower left side showed the second bicuspid to be congenitally absent, thereby complicating the case. The question naturally arises "what effect would this have upon the predetermination?" It was previously stated in this paper that the upper arch of a certain size had a corresponding lower. Therefore, we selected 89½ (No. 12 for upper and No. 12 for

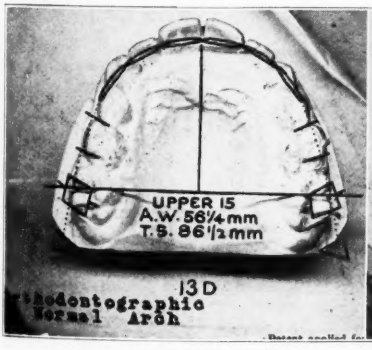


Fig. 13D

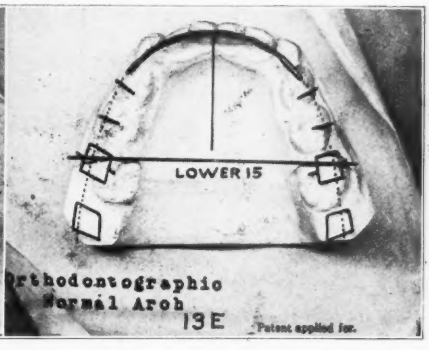


Fig. 13E

lower) our idea being to place all lower teeth in their molar position from the six year molar on the right side to the first bicuspid on the left, then to move forward the first and second molars on the left side.

Figure 14 E shows surveys of the upper and lower occlusal lines, the upper having had nothing in the line of appliances for over a year. The lower has removable working retainer. Note that the first and second molars have been moved forward, left side.

Figure 14F shows the occlusion of left side which has a good working occlusion and showed no trauma upon test. Figure 14G shows the right side, while Figure 14H is a photograph.

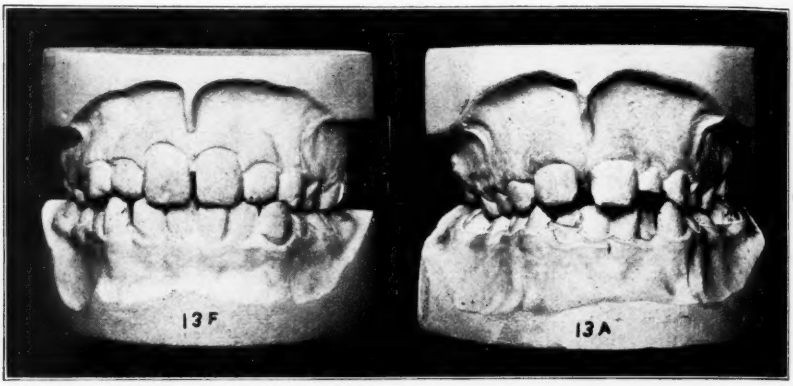


Fig. 13F

Fig. 13A

Figure 15A is a case of a girl nine years of age neutroclusion—showing excessive overbite due to the elevation of the anterior maxillary division.

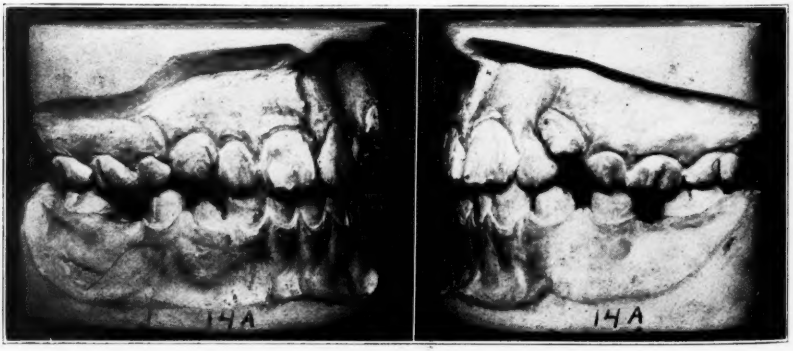


Fig. 14A

Figure 15B shows the lingual view with surveys, upper having tooth substance of 83½ mms.

Figure 15C shows surveys of upper

in 1918; Figure 15D, survey of case June, 1922; Figure 15E, occlusion in 1918; Figure F, occlusion in June, 1922; and Figure 15G, photograph.

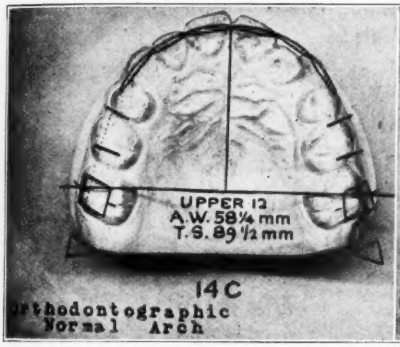


Fig. 14C

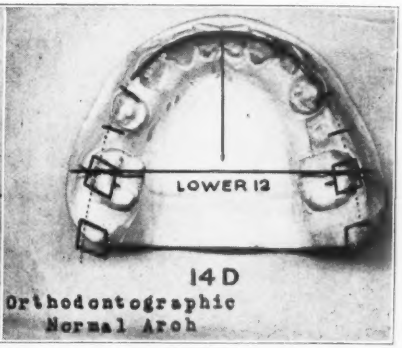


Fig. 14D

Note the change in overbite as compared to Figure 15A.

Figure 16A shows a case of a young man twenty years of age with excessive overbite which was wearing down his lower anterior teeth.

Overbite

The overbite is controlled by two factors: (a) the relation between the upper tooth substance and the lower tooth substance; (b) the inclination of the bicuspids and molars on the lower arch.

In the past few years there has been much discussion relative to disharmony between the upper and lower tooth substance, to such an extent that it would lead one to believe that it was of common occurrence, but in over 5,000 cases which have been measured, it has been very rare. The lower arch has been found to contain from 8 to 12 mms. less tooth substance than the upper, therefore, if you have a tooth substance with only 8

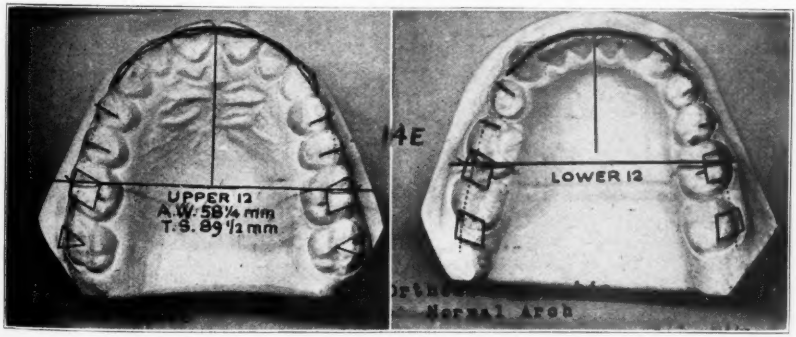


Fig. 14E

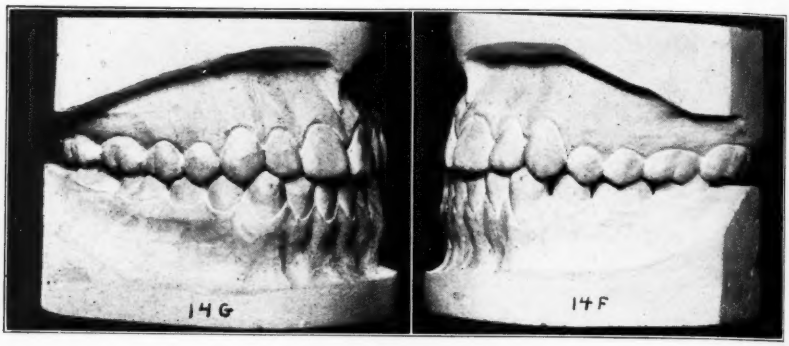


Fig. 14G

Fig. 14F

Fig. 14H

mms. difference between upper and lower, we have a short overbite and with 12 mms. a deeper overbite.

lower tooth substance, 89½ mms. and arch width, 58¼ mms. The survey shows the necessary movement for the

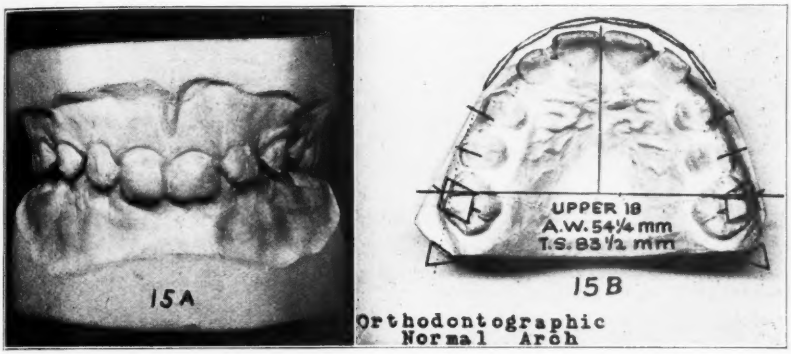


Fig. 15A

Fig. 15B

Inclination of Molars and Bicuspids

The overbite can be varied by tipping bicuspids and molars lingually. Tipping lingually deepens overbite and tipping buccally decreases the overbite. In

required arch line, which is the contact point line. The lower survey shows that the molars and bicuspids should be tipped buccally to relieve excessive overbite.

Figure 16C shows the completed case

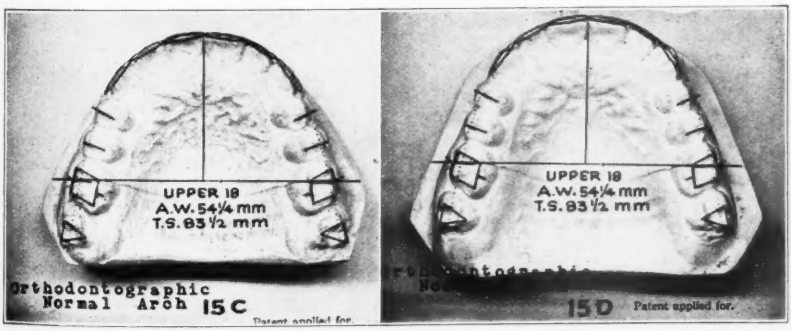


Fig. 15C

Fig. 15D

the treatment of orthodontic cases the operator is able to get occlusion in case under treatment by slight lingual tipping of the molars and bicuspids.

Figure 16B shows the upper and

(occlusal view). Figure 16D shows the occlusion after treatment. You will note the slight buccal position of the upper right second bicuspid due to the malformation of the lower second bicus-

pid. The tooth was rotated and placed in its position, but nature settled the occlusion. I might say here that although we work toward an ideal, occasionally nature will make slight variations in our work, and although this is not the perfect arch as we have pictured it, yet it cannot be construed as malocclusion; it is simply the individuality of that particular case. This illustrates the change which may take place by tipping the bicuspids and molars with proper arch lines.

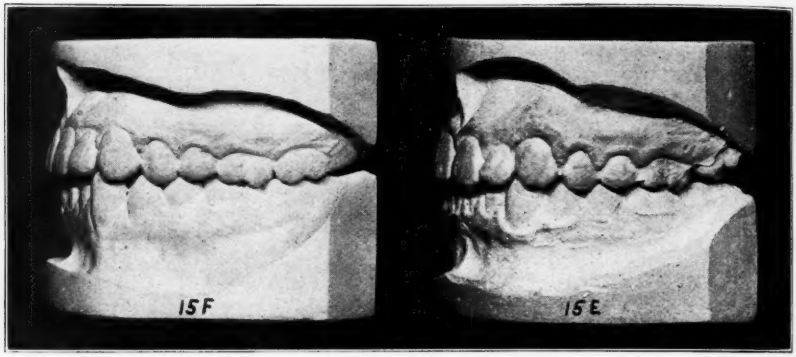


Fig. 15F Fig. 15E

Fig. 15G

Figure 17A is an original upper model, October, 1917; Figure 17B, original surveys, October, 1917.

I wish to call to your attention that although this is the case of a small girl, she has very large teeth—89½ mms. Figure 17C shows the survey after six months treatment, and Figure 17D shows the occlusion after six months treatment. Figure 17E shows the surveys four years later, after the loss of all temporary teeth—with all permanent teeth, up to and including twelve year molars in position. This case was not retained and had no appliance since April, 1918. Figure 17F shows occlusion June, 1922 and Figure 17G shows photograph June, 1922.

Conclusions

1. The predetermination of the dental arch with full complement of teeth and with mixed denture is practical.

2. The orthodontographic arch is the most practical concept of the dental arch at present. It is so near what nature intended for the ideal arch that

Fig. 16A Fig. 16D

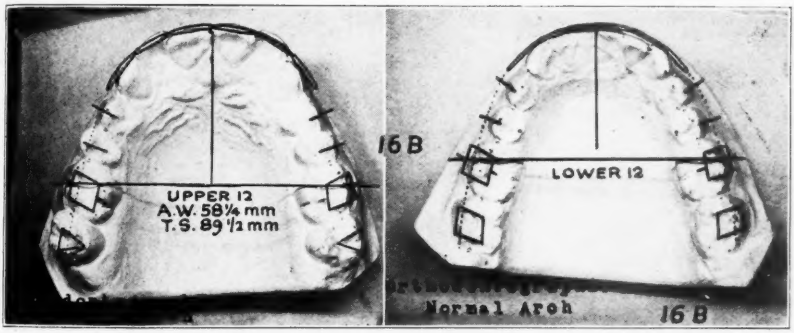


Fig. 16B

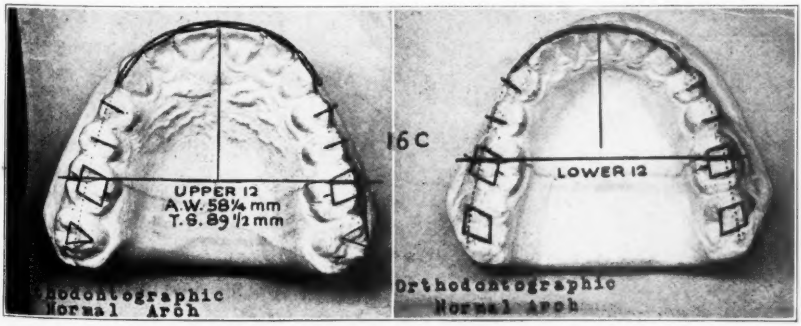


Fig. 16C

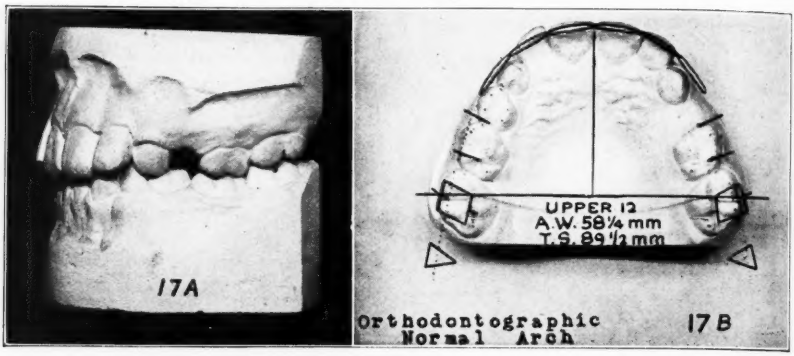


Fig. 17A

Fig. 17B

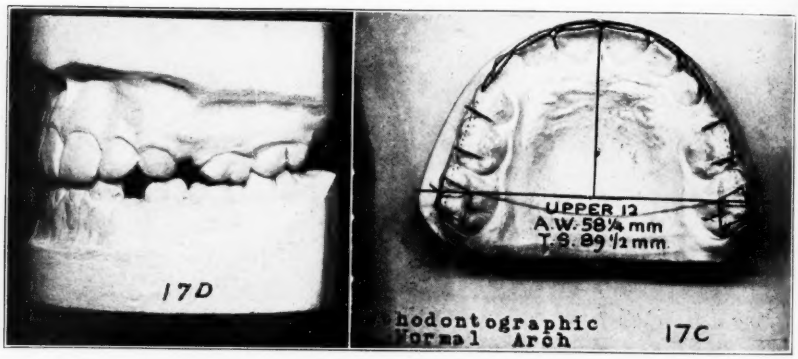


Fig. 17D

Fig. 17C

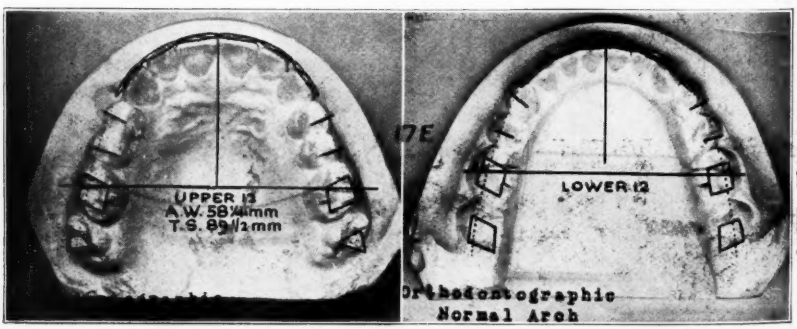


Fig. 17E

if teeth are placed in that arch there will be coordination of all the occlusal factors.

3. Symmetry and assymetry of arches is easily obtained.

4. Conveys a definite diagnosis to patient.

5. Facilitates the designing and construction of apparatus.

6. It is the medium by which we obtain a continuous checking up of the progress of the case.

7. It definitely establishes the completion of the operation.

stances was rather too much for most of us, and helped to give all such systems of predetermination a certain degree of unpopularity.

Bonwill, in his work on articulation of the teeth examined 4000 dentures in living persons and 6000 skulls and from these observations established as a standard, an arch based on the equilateral triangle and conforming closely to the most perfect arches found. The work of Bonwill has been the foundation upon which the more recent investigators of normal arch form have developed the present valuable methods of arch predetermination.

Hawley adapted Bonwill's plan to orthodontic use. In the charts prepared by Dr. Hawley, the six anterior teeth are arranged

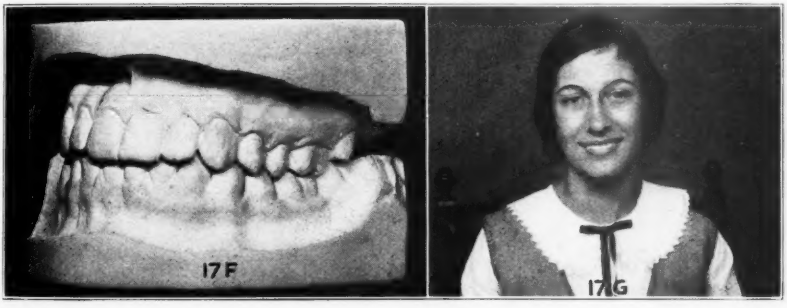


Fig. 17F

Fig. 17G

8. It clearly indicates singly or ensemble any recurrence of malocclusion after dismissal.

9. It permits the continuity of work without duplication or chance of error continuity upon a patient changing his residence.

Discussion

John R. McCoy, Los Angeles, California: I believe I am correct when I say that the majority of orthodontists are prejudiced against the use of any of the present methods of normal arch predetermination. This prejudice is due either to a lack of knowledge of the subject or the fact that their years of experience has enabled them to develop arches for their patients with a close semblance to the normal without the use of these aids. I believe also that the injection of complicated engineering formulae and instruments which only a graduate of a technical school can handle as has been done in one or two in-

on the arc of a circle, the diameter of which, is taken from the combined width of central, lateral and cuspid teeth. The balance of the arch is determined by completing the geometric plan with which you are no doubt familiar.

Dr. Gilpatric, to my mind, has used the fine points of the systems already perfected with valuable additions, so that I think that after careful analyses you will agree that the ideas which his charts carry out are as correct as one could expect from a purely mechanical method. The fact that the size and form of Dr. Gilpatric's arch is governed by the width of tooth substance, from buccal groove to buccal groove of the first molars, seems to make it less liable to miscalculation. It seems to me that Dr. Gilpatric's charts will prove a great help to the beginner in orthodontia, as it will teach much in the way of arch analysis. It is surprising how your diagnosis will differ in some cases from the usual offhand method, providing you use some symmetrical plan,

such as this. Arch predetermination to my mind is essential in some cases. It will save considerable grief and lessen the liability to have secondary treatment, which must follow an improper diagnosis and treatment.

It has always been the desire of our profession to make orthodontia an exact science, in fact we have often heard it said that it is an exact science. Certainly, such an aid as Dr. Gilpatric has demonstrated will go a long way towards eliminating "hit and miss methods" from orthodontia and as such we should welcome it.

Carl O. Engstrom, Sacramento, California: This application of dimension to form should not be confused with arch predetermination in its relation to the course of development of the dental arch, for, in such case, with the everchanging conditions of development, arch predetermination is a matter of imagination based on our concept of development. On the other hand, as a means of assistance, particularly in the study and treatment of a case, Dr. Gilpatric's method of surveying the dental arch and the use of his orthodontographic charts provides us with something of exactness that may be easily comprehended and used. This distinction should be clearly understood if proper use be made of arch predetermination, and its value truly appreciated.

Dr. Gilpatric mentioned "tipping" premolars and molars in order to change the bite and the overlapping of the anterior teeth. This is a treatment worthy of note. However, due consideration should be given to the positions of these buccal teeth before such movement is resorted to in the effort to change the bite. We do find in some cases of too great an overbite lower premolars and molars inclined lingually, in which instance it is quite logical to move the crowns of these teeth buccally. In so doing not only may the overlapping of the anterior teeth be changed but the premolars and molars are then in such positions as to transmit force principally in line with their long axes, thus providing for the greatest functional efficiency of these teeth. In this day when lingual arch wires are used so extensively and in some cases so strenuously, it is well to be guided by a definite outline such as presented by Dr. Gilpatric.

Where study models, made from time to time during the course of treatment, are used in the study of tooth movement, it is most convenient to superimpose the occlusal surfaces with Dr. Gilpatric's orthodontographic charts. They being of celluloid this is easily done. It should be remembered that in the treatment of malposed teeth we are ever at the mercy of the forces of occlusion, and too much should not be expected of arch predetermination in the sense of expecting natural forces to be altered with certain dimensional precision.

F. W. Epley, San Francisco, California: Does this method assume that all arches are of the same shape, namely irrespective of the shape of the mandible, or the thinness of one face or the roundness of another?

Dr. Gilpatric, (closing): Dr. McCoy spoke of the beginner in orthodontia. It makes no difference how skillful the operator may be, he should have a definite standard from which to work. I think, in all cases, no matter how simple or complicated, if we have a guide, it simplifies our work.

Dr. Epley asked as to the shape of the arches. It has been my aim to prove that a definite ratio exists between the zygomatic arch in its width and the width of the maxillary arch at the time of the eruption of the six year molars, provided that there has been a normal development of all surrounding structures. I think that will be worked out, and it is up to the orthodontist to do it. This method does not prevent any man using his individuality in any particular case.

I think Dr. Engstrom misunderstood me in the matter of tipping of molars and premolars. I was speaking of malposed teeth, and not teeth in normal occlusion.

I do not claim this method is final. If any man has any idea he can improve on it, I want him to do it by all means. I have simply given a basis on which to work, and desire the assistance of all orthodontists.

THE EFFECT OF DEFECTIVE DIETS ON TEETH

THE RELATION OF CALCIUM, PHOSPHORUS AND ORGANIC FACTORS TO CARIES-LIKE AND ATTACHING TISSUE DEFECTS

By CLARENCE J. GRIEVES, A.M., D.D.S., Baltimore, Maryland

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)[1]

FROM its inception, dental literature contains many statements associating food habit with oral disease. Dietary errors or excesses are said to be predisposing, if not active causes of dental caries and gingival lesions. It is also implied that these diseases do not exist in races or individuals with correct food habits, the inference being that a proper dietary regimen will prevent oral pathological conditions.

Tangible evidence of what constitutes a correct diet is not offered by the donors of these hypotheses, which when applied in daily routine, are not practical in the individual, whatever they may be en masse.

We are told that races living under primitive dietary conditions are free from oral disease; the Eskimo is said to be immune, for the reason that he is essentially carnivorous, using little carbohydrate food; and the Maori, because he consumes quantities of carbohydrate and little protein food.

In the midst of this exigency, stands the fact that Anglo-Saxon races of all climes, with the greatest abundance and diversity of food, are being involved by oral disease to an alarming extent.

Function, or the lack of it, is said to be the predetermining factor in the induction of oral disease. The refinement of foods, which are softened by cooking, is cited to explain the prevalence of dental disease with every advance in civilization, in spite of the fact that individuals of civilized countries obtain a larger percentage of better food per capita than primitive races.

It is claimed, for example, that just as the consumption of refined cane sugar and bolted flour increases, so the ratio of dental caries is raised, until today it involves twenty-five per cent of the teeth of eighty-five per cent of American school children.

For the most part, these statements are generalizations with as much foundation in fact as casual observation permits, though they all may contain elements of truth.

There are so many qualifying and disturbing factors entering into any investigation of diet in relation to disease, that the student is soon lost in a maze of the relation of the simplest basal dietary elements to digestive and metabolic processes, not to mention the modifying influence the endocrine glands and pathogenesis may have upon the resultant equation.

It is well, therefore, to hesitate before drawing conclusions as to the simplest diet fed an experimental animal, for it does not necessarily follow that these elements arrive in the cells of osseous and dental tissues without profound modification, which digestive and metabolic processes are bound to induce.

This is well illustrated by the present

[1]Also read before the American Medical Association, St. Louis, Missouri, May 24, 1922.

tendency to associate deficiency diseases with absence of vitamins to the neglect of more important basal dietary factors.

It is recognized that too great a simplification of the diet may in itself lead to deficiency disease, yet under these conditions the question can only be intelligently approached by a study of diets which make for well being in the animal and are as elemental as possible. That such dietary study is feasible has been proven by McCollum and Simmonds, their associates in some eight thousand animal dietary experiments.

For the sake of clarity in this report, but three basal dietary factors are considered: calcium, phosphorus and the organic substances existing in butter fat and cod-liver oil in relative concentration and percentage.

It was my good fortune to study oral conditions in the same group of rats which were used in the recent research on rickets and related osseous pathology by McCollum and Simmonds, Shipley and Park, of the Chemical Hygiene and Pediatric departments, Johns Hopkins University. Reports of these researches which are too voluminous for quotation are available to those interested.

Osseous and dental tissues are so closely related that a summary of conclusions follows for comparison:

"These reports have shown that the internal structure of the skeleton of the rat could be changed at will by varying the ration which the animals received. In other words, bone is an extremely labile tissue and is readily influenced by nutritional environment" (1).

"A study of the effects of these diets on the skeleton would indicate that the growth of the skeleton was dependent on at least three substances: (1) an organic substance present in certain fats which may, or may not, be identical with the anti-exerophthalmic fat soluble A: (2) calcium and (3) phosphorus" (2).

"If the organic factor is low in, or missing from a diet, the structure of the osseous tissue is dependent on the ratio between the above mentioned ions in the diet and circulating blood."

"If calcium is present in amounts equal to, or exceeding those which would be optimal for growth and function, if all other factors are satisfactory but the phosphate ion is low, rickets is produced" (3).

"The same disease results when the converse relation exists between the two ions" (4).

"In other words, diets which contain optimal or excessive amounts of calcium but are low in phosphorus and the organic factor produce rickets."

"Rickets also results from feeding diets low in calcium and the organic factor if phosphorus is present in satisfactory amounts."

"Diets which are satisfactory except that they are deficient in the organic substance result in osteoporotic but perfectly calcified bone."

"Diets which have a comparative deficiency in calcium but are very high in phosphorus and in the organic substance, produce so-called osteosclerosis, with large numbers of small imperfectly calcified trabeculae."

"Diets deficient in calcium alone produce a pseudo-rachitic condition with overproduction of osteoid" (5).

"The studies of diets which contain varying percentages of the calcium and calcium phosphate show that the absolute amount of either ion in the diet is of relatively little importance as compared to the ratio which exists between the two. That is, normally calcified bone is produced without regard to the reduction or diminution of either calcium or phosphate in the food, provided the content of the other ions is proportionately augmented or depressed."

In experimental studies of diets in the rat, it was found that good growth, well being, fertility and normal osseous tissues were induced when the relation

of the total calcium was .64, and phosphorus .41, to 100 grams by weight with butter fat at 2.5 per cent and cod-liver oil 1.5 per cent (of total diet) representing the organic factors, provided other dietary elements were correct.

In this paper five diets are presented, which were selected from the fifty-seven previously reported, where oral conditions were studied in relation to osseous disease (6).

That the dietary equation might be further simplified, the percentage of phosphorus in all of these is optimal (.41 to the 100 grams), while calcium and the organic factors in butter fat and cod-liver oil are intentionally varied above or below normal percentages.

This was accomplished "without making the deficiencies or concentration any greater than those which occur in the table of the modern American family" (6).

It is emphasized that no cane sugar exists in these diets; in one, ten per cent of whole milk powder occurs, which contains its small percentage of milk sugar. If oral fermentation has any part in inducing these lesions, the starches in which these diets abound, may be active factors.

All diets were so finely ground as to prevent selection of food and all experimental animals were adults and were placed upon the diets when about sixty days old. They were taken, without selection, from the stock colony which lives on a stock diet under the best possible hygienic laboratory conditions and is free from other disease.

These diets all contained ample water soluble B, as the rat synthesizes water soluble C, the gingival lesions to be reported, are not scorbutic as in the guinea pig.

It may be stated, as a control, that the stock rats in this colony of 1200 show no caries-like or attaching tissue defects.

Eighty-five rats, about equally divided as to sex, were placed on the following diets.

GROUP I. *Low Calcium Diets*

(CHART 3)

LOT 2769

Wheat	30.0
Maize	10.0
Rice	10.0
Rolled Oats	10.0
Peas	10.0
Navy Beans	10.0
Casein	10.0
Butter Fat	10.0

LOT 2581

Liver	29.0
Casein	10.0
Nacl	1.0
Kcl	1.0
Dextrin	65.0
Butter Fat	3.0

LOT 2883

Liver	29.0
Casein	10.0
Nacl	1.0
Kcl	1.0
Dextrin	66.0
Cod-Liver Oil	2.0

"Lots 2769—2581 and 2883 are grouped because the only deficiency is a lack of calcium. In 2769 casein improved the vegetable proteins and in 2581 and 2883 the addition of liver enhanced these factors. Butter fat and cod-liver oil furnished fat soluble A. All factors are satisfactory except calcium; when it is added to these diets, good growth and high fertility occur; without it, there is little growth and no young are produced" (6).

GROUP II. *Low Calcium and Low Fat Soluble A Diets*

LOT 2408—CHART 9

Flour (patent)	20.0
Cornmeal	19.5
Rice	9.5
Rolled Oats	9.5
Peas	9.5
Navy Beans	9.5
Beef Steak (round)	10.0
Nacl	1.0
Dextrin	1.5
Pow. Whole Milk	10.0

"This diet contains milled cereals, milk and meat; it is lacking in calcium and fat soluble A. Rats confined to this diet do not grow fully, age early and are not fertile. Families confined to this diet show gradual deterioration. It is only necessary to add calcium and fat soluble A to entirely change the life history of the individual. This diet has been much studied in our laboratories. It contains all of the deficiencies and errors of the average American menu" (6).

GROUP III. *High Calcium and High Butter Fat Diets*

LOT 2775—CHART 6

Wheat 25	25.00
Maize	20.00
Rice	9.5
Rolled Oats	9.5
Peas	9.5
Navy Beans	9.5
Casein	10.0
Nacl	1.0
Ca Co 3	3.0
Butter Fat	3.0

"This diet is well constituted except the calcium is double the optimum. Rats grow well while on it and are fertile, but the young die early. The second generation was stunted, for excessive calcium causes early deterioration" (6).

It is most important in considering the effect of diet upon teeth that the animal be an omnivorous feeder and that the teeth and attachments be comparable, numerically and histologically, to the human. Guinea pigs and rabbits which ingest herbivorous diets of succulent roots and leaves, and in which the entire denture grows persistently, are not comparable in digestive function nor omnivorous dietary to man.

Dogs, pigs and monkeys present ideal oral conditions for experimental study, but they litter infrequently and are prone to infectious diseases. They develop osseous defects, if confined under laboratory conditions and, if allowed freedom, obtain small but definite food factors, which might modify the experiment.

The disadvantages of the rat denture, which is small and presents histologic difficulties, are more than offset by assurance of correct experimental conditions. Rats are omnivorous and are prolific breeders, so that many generations can be studied. They do not suffer from confinement nor the monotonous diet of the laboratory.

In the denture of the rat, the four incisors grow from persistent pulps, while the twelve molars are coronally and apically completed teeth, all of which are erupted by the fortieth day. The cusps are of the bunodont type, associated with omnivorous diet rather than the lophodont type, associated with the herbivorous diet, as in the guinea pigs.

While the rats' incisors are subject to resorption and repair by persistent pulp function, like incisors and molars of guinea pigs, the rats' molars are coronally and apically finished teeth, and except for size, numerically and histologically comparable to the human molars.

Excellent enamel surfaces in perfect proximate contact; simple dentin of the ortho variety and large pulps with evident high resistance, are all excellent indicators of any lesion.

Subgingival attachments are dense and wonderfully adapted to function; the roots present definite cemental laminae with closed and pointed apices and multiple foramina. Well defined periodontal membranes are attached by stout alveoli, furnishing excellent support to gingival crests which lie in perfect contact, protecting embrasures.

In the rat, the relation of masticatory function to diet is ideal; like all rodents, they must literally "chew for dear life": whether the diet be soft or hard, the denture is used until disintegrated and all teeth are abraded by their own interaction.

Any disturbance of this highly vital

nutritional function in adult rodents must indeed be fundamental. Under such conditions, it is, therefore, interesting to find caries-like and attaching tissue lesions involving teeth of adult rats, when placed upon the foregoing diets, with no such defects in the stock controls.

Percentages of lesions are calculated on the number of teeth involved (12 molars); the number of rats placed upon these diets, and the period upon the diet, which averaged 120 days.

Thirty-six per cent of the males and forty-four per cent of the females showed caries-like and attaching tissue defects; with increasing percentages in the littering rat, the oral condition of which is most interesting.

In Group I the Low calcium diets (Chart 3), phosphorus and fat soluble A were nearly optimal, while calcium was about one-half the normal; the diets are thus simplified to one defect with all other factors well balanced. When the ash of a diet is acid, as in some of these, it appears to increase the tendency to lesions.

Twenty-two per cent of the rats on these diets showed caries-like defects and 3.65 per cent of their molars were involved. Forty-one per cent displayed attaching tissue lesions, which involved the molars to the extent of 57.9 per cent. It has been noted that "diets deficient in calcium alone produce a pseudo-rachitic condition with overproduction of osteoid."

Skeletal defects were pronounced in this group and a large percentage of the alveolar involvement was anticipated. It cannot be assumed, however, that diets which involve long bones will always affect tooth attachments, for such is not the case.

It is also evident from the contrasting percentages of caries-like lesions (3.65 per cent) and attaching tissue defects (57.9 per cent) that, as far as dietary factors are concerned in the induction of these lesions, they are not the same.

In Group II (Chart 9) the Low Calcium and Low Fat Soluble A Diets, phosphorus was optimal, while calcium was one-third of the normal and fat soluble A was relatively low; this produced two deficiencies, with all other dietary factors well balanced.

Thirty-one per cent of the rats on these diets showed caries-like defects and 5.21 per cent of their molars were involved. Twenty per cent displayed attaching tissue defects which involved the molars to the extent of 17.7 per cent.

The contrast in this group is remarkable. A twofold deficiency, which in the previous study of fifty-seven diets, produced the greatest percentage of caries (5.21 per cent) in this type diet produced only (17.7 per cent) attaching tissue lesions, which was next to the lowest in the previous series of three hundred rats.

It has been noted that "rickets results from diets low in calcium and the organic factor, if phosphorus be present in satisfactory amounts."

The fact that these diets, which produce experimental rickets and a large percentage of caries-like lesions in the rats, induce such comparatively slight attaching tissue disturbance cannot for the moment be explained. It appears to confirm the clinical observation that when human caries involves the adult denture, the incidence of gingival disease is low.

It must not be concluded that diets which produce experimental rickets also induce caries-like lesions. A large group of animals in the previous report where definitely rachitic, yet macroscopically, suffered few oral defects of any type.

This low calcium and low A diet is here reported for this very reason, that rachitic and caries-like lesions are so rarely coexistent.

As there is a prejudice against com-

paring deductions from animal experiment with human experience, it might be well to explain these percentages. "With the rat's life cycle at 1 to 30 for the human, a rat from 120 to 150 days old is comparable to a child between the tenth and thirteenth years, especially when differences in developmental cycles are considered. At these ages, the child's teeth are said to be 25 per cent carious, but 12 or 50 per cent less teeth are exposed to carious processes in rats, when compared with an average of 24 teeth in children; and 12.5 per cent represents a like reduction of the 25 per cent child caries. When the 12.5 per cent for the child is compared with 5.21 per cent for the rat, and when the period of exposure, which was much shorter in the rat, is considered, the discrepancy is not so great as might appear" (6).

The incidence of human gingival disease in adults cannot be stated; it is evidently high, but that it so rapidly involves individuals, or their teeth, in any such percentages as here presented for the rat is questionable.

In Group III (Chart 6) the High Calcium and High Butter Fat Diets, phosphorus and fat soluble A were optimal, but calcium was twice the optimum. This produced but one deficiency, with all other dietary factors in balance.

Seventeen per cent of the rats on this diet showed caries-like defects and 1.73 per cent of their molars were involved. Twenty-eight per cent displayed attaching tissue defects which disturbed 33 per cent of the molar attachments.

It has been explained that high calcium diets produce good growth but early deterioration with pseudo-rachitic changes in bone, particularly in the second and third generations.

The lesions resulting from this diet, 1.73 per cent caries and 33.3 per cent attaching tissue lesions are in direct contrast to the low calcium and low fat soluble A diet, where the caries-like defects were the highest, 5.21 per cent and the attachment disturbance nearly the lowest, (17.7 per cent) in the entire series.

Description of Caries-Like Lesions

The essentials of the modern conception of dental caries are environmental. It is believed that caries progressively invades teeth from without inward and that it may result from chemico-microorganic causes in any retention center. Whatever the bacterial types, they are presupposed to produce sufficient acidity to decalcify enamel and dentin, and be sufficiently proteolytic to complete dentinal destruction.

This idea does not deny that teeth may not be predisposed to caries from developmental structural defects which may result in early formative periods and may assist in localizing carious lesions.

It recognizes the fact that the finest types of enamel and dentin may be invaded in the same mouth and even the same tooth, while hypoplastic enamel and dentin may escape.

Other than this distinction, it does not admit that completed teeth are weakened from within by resorption of dentin or interglobular space formation arising from dental pulp function, nor that enamel may be softened from within, nor that it is permeable or vital.

These facts are reviewed for the reason that there have appeared certain sections of rats' molars, which suggest some internal factor in human dental caries but not in this group of diets.

"The lesions in these groups always proceed from without inward and do not result from hypoplastic enamel, nor are they absorptions from dental pulp function. Clinically, they are identical with human caries."

"The minute and slowly enlarging initial lesion in any deep enamel sulcus; the rapid dentinal invasion, undermining enamel walls; the typic laminated caries

dentinal detritus and the final pulp exposure, followed by subapical bone involvement and alveolar abscess are classic, macroscopically" (6).

The distal sulcus of the first and the central sulcus of the second molars are usually seats of initial lesions which may be due to food retention. Mesial and distal contact facets are occasionally secondarily involved, but they are not primarily attacked as in the human. This immunity may arise from the excellent, proximate contact and protection of embrasures by attaching and gingival tissues.

These lesions were studied in ground and decalcified sections. Coriell's lapping machine was used in grinding and Mueller's fluid in decalcification. By the latter method, occasional slides were obtained without complete loss of enamel. Slides were stained with thionin silver and carmine.

Microscopic sections show slow decalcification of enamel, either by loss of inter-rod substance or complete disintegration of both rods and cement substance. Dentinal invasion spreads typically undermining enamel along the dentoenamel junction.

Tubuli are enlarged and invaded irregularly; characteristic areas appear, showing complete loss of matrix and projection of fibrils into masses of proteolyzed dentin containing bacteria.

Dentinal destruction seems much slower and more regular than in human caries. Frequently observed tubular calcification and osteodentin formation indicates a pulpal resistance much higher in the rat than in man.

Pulp involvement and exposure is not unusual. In old cases, the entire tooth becomes dark and necrotic and apical abscess results with typic apical denudation and destruction of subapical tissues.

In some instances, granulomatous or cystic types of apical disease occur, presenting symmetrical bone areas well walled off by condensing osteitis and lined by fibrous tissue, as the stains indicate. In others, much bone liquefaction results with fistulae. These are evidently of the purulent type and occasionally result in large osteomyelitic areas.

The Attaching Tissue Lesions

In reporting these defects "only such gross osseous lesions as actually exposed cervical aspects of roots or finally caused loss of teeth are presented."

The "flare" of the rats' molar roots is so great and they are so well attached, it may be assumed such teeth are not lost without the persistence for some time of soft tissue lesions.

"Attaching tissue defects occur in two groups (a) the atrophic types, with progressive horizontal and regular loss of alveolar crests the cortex remaining hard, rounded and smooth, and (b) the infective type, with irregular vertical invasion of alveolar walls and localized root exposure, in which the cortex is rough, porous or missing," (6) as in true pyorrhea. "In short, all phases of the osseous lesions of gingival disease occur as in the human."

In both maxilla and mandible, the lingual crests are most frequently lost. The disease may localize about one molar or may be general. If complicated by caries and loss of proximate contact, food pack and trauma soon destroys the tooth.

Microscopic slides show much involvement of alveolar walls, which are osteoporotic or cartilaginous but still remain, supporting the gingival crests. Occasional peninsulas of bone persist but trabeculae are indefinite and canalization frequently results. There is much osteoid and round cell infiltration. Deep pockets occur, lined by epithelium, supported by the remaining periodontal fibers, but it cannot be said that they arise by central invasion of the periodontium along lymphatics, as in true gingival disease. Cervical deposits of calculi were noted in some instances.

While only certain rats suffered from caries-like and attaching tissue lesions, as the percentages indicate, the impression must not obtain that these lesions did not appear simultaneously in the same rat, for fully one-third of the group were so involved.

These experiments had none of the mathematical accuracy of the feeding of scorbutic diets to guinea pigs, which is said to produce one hundred per cent scurvy.

The varying percentages of damage to tissue present a remarkable resemblance to human disease; they indicate the resistance of the individual rat to these diseases. Its immunity, its superior digestive and metabolic processes, or possibly other factors, evidently protected its teeth and attachments against invasion.

The constancy of the character of caries-like lesions is interesting. From what has been observed, no matter what the dietary defects, they are remarkably alike in microscopic section. Quite the reverse is true of the diseased attachments, the pathological character of which differs materially, but it is not possible as yet to state the type of lesions induced by any particular diet.

Indeed the entire phenomena runs so true to clinical experience as to tempt one to conclusions which might be premature, for like the human, these lesions appear to result from all types of dietary defects, and it would appear that the animal economy can form and maintain a fine denture with attachments on very restricted diets, provided they be in proper dietary balance.

In the absence of cane sugar and with starch as the only oral fermentive medium, it is possible to indulge in many fascinating and plausible hypotheses as to the cause of dental caries, all of which are apt to be wrong.

It might be reasoned, since the largest caries-like percentages occurred in Group II, which contained ten per cent whole milk powder, that even this percentage of milk sugar might have increased the fermentation in the starches in the diet and induced dental caries, were it not for the fact that the stock diet contains a larger percentage of milk and the teeth of stock rats are not carious.

From certain evidence, it might be said that disturbances of the calcium-phosphorus balance of the blood, of tetany and rickets, were the main factors in caries, but nearly all children have carious teeth and few children are rachitic or involved by tetany; the reverse is equally true, while very few children, as compared with adults, suffer from gingival disease.

The intricate relation of calcium and phosphorus in the blood to the endocrines and to tetany and rickets has been explained by Howland Tidsdall and Kramer (7 and 8).

"Tetany is an expression on the part of the nervous tissues of an insufficiency of the calcium ion; rickets is an expression on the part of the skeleton of disturbed relations between the calcium and phosphate ions." "The reason that tetany is so frequently associated with rickets is because rickets is a disease, in which the calcium ion in the body tissues and fluids is subject to wide variations" (4). Both of these diseases depend upon the calcium-phosphorus balance in the blood but may occur independently of each other.

Typical rachitic lesions and symptoms are known to result from two types of disturbance as indicated by the blood, i. e. "one where calcium was normal and phosphorus low (low phosphorus rickets) and the other where phosphorus was normal and calcium low (low calcium rickets) and there may be others (4).

Alveolar lesions, which are exposed to oral infection and occlusal trauma, are hardly likely to be more concrete than the internal lesions of rickets. On the contrary, they might be expected to pre-

sent many more complicated pathological expressions of simple dietary defects.

This hypothesis cannot as yet be applied to dental caries. It is reasonable to suppose that disturbance of the osseous attachments of teeth might occur from within outward, by the vascular pathway; and that gingival disease might result from the same internal etiological causes as rickets; but dental caries is an invasion of the tooth, arising externally, and proceeding from without inward. Therefore, one must think of the oral environment, plus the dental structural defects permitting such invasion.

In these specimen, caries-like lesions are so far removed from being an internal disturbance, or resorption of enamel and dentin by pulp function, that the pulp actually protects its vascularity by tubular calcification and secondary dentin formation.

Malfunction of the endocrine glands has been enthusiastically advocated as the etiologic factor in dental caries; these claims are based upon clinical observations of hypoplastic and dystrophic teeth found in cretins; and acromegalics. Similar lesions also are said to result from lues, exanthemata and artificial infant foods.

Certain defects in the teeth of dogs, monkeys and rats are reported to result experimentally from damage to the endocrines, particularly the thyroids and parathyroids.

In a previous paper, (6) it was shown that many of these defects could be duplicated in rat's teeth by the use of defective and deficient diets, with no apparent symptoms of endocrine disturbances in those which were posted.

Unless the animal's diet is known and definitely planned, according to modern dietary usage, these conclusions as to the relation of endocrine experimental malfunction and oral disease, are useless and misleading.

I am aware of the recent work of McCarrison (9) and Broderick (10) and it seems highly probable that defective endocrine function and disturbed metabolism may be intimately associated with the use of defective and deficient diets; and any, or all, of these factors may play an etiological role in oral disease, but these correlations are as yet hypothetical.

Until further facts are available, one can only think of the necessity for a proper calcium-phosphorus-organic factor balance in any diet, as most important in the formation and maintenance of normal bone and teeth, and healthy attaching tissues.

Bibliography

1. McCollum, E. V.; Simmonds, Nina; Shipley, P. G.; Park, E. A. I. Studies on Experimental Rickets. The Production of Rachitis and Similar Diseases in the Rat by Deficient Diets." *Journal Biological Chemistry*, Vol. XLV, No. 2, June, 1921.

2. Shipley, P. G.; Park, E. A.; McCollum, E. V.; Simmonds, Nina. III. "Studies on Experimental Rickets. A Pathological condition bearing Fundamental Resemblances to Rickets of the Human Being Resulting from Diets Low in Phosphorus and Fat Soluble A; The Phosphate Ion in its Prevention." *Johns Hopkins Bulletin*, Vol. XXXII, May, 1921.

3. McCollum, E. V.; Simmonds, Nina; Shipley, P. G.; Park, E. A. VI. "Studies on Experimental Rickets. The Production of Rickets by Diets Low in Phosphorus and Fat Soluble A." *Journal Biological Chemistry*, 1921, Vol. XLVII, p. 3, 507.

4. Shipley, P. G.; Park, E. A.; McCollum, E. V.; Simmonds, Nina. XIX. "Studies on Experimental Rickets. Is there more than one kind of Rickets?" *American Journal Diseases of Children*, February, 1921, Vol. XXIII, p. 91, 106.

5. Shipley, P. G.; Park, E. A.; McCollum, E. V.; Simmonds, Nina. VII. "Studies on Experimental Rickets. The Relative Effectiveness of Cod-Liver Oil as Contrasted with Butter Fat for Protecting the Body against Insufficient Calcium in the Presence of a Normal Phosphorus Supply." *American Journal of Hygiene*, 1921, p. 1, 4, 512.

6. McCollum, E. V.; Simmonds, Nina; Kinney, E. M.; and Grieves, C. J. I. "The Relation of Nutrition to Tooth Develop-

ment and Tooth Preservation." *Johns Hopkins Bulletin,* June, 1922.

7. HOWLAND J. AND KRAMER B. "Calcium and Phosphorus in the Serum in Relation to Rickets." *American Journal Diseases of Children,* p. 22, 105, August, 1921.

8. KRAMER, B.; TIDSDALL, F. F.; AND HOWLAND, J. "Observations on Infantile Tetany." *American Journal Diseases of Children,* p. 22, 431, November, 1921.

9. MCCARRISON, R. Studies in Deficiency Disease. *Oxford Press,* 1921.

10. BRODERICK, F. W. "The Effect of Endocrine Derangement on the Teeth." *British Dental Journal,* Vol. XLI, No. XX.

DISCUSSION

Percy R. Howe, Boston, Massachusetts: I feel with Dr. Grieves that all animal experimentation must be interpreted conservatively. Such work is merely suggestive. Many animals are immune to diseases that are common to man or to other animals. The metabolism of animals differs, and it may be quite different from that of man. As a profession we should have done more good to our fellow men if we had accepted many theories with such conservatism.

So far as dental caries and our treatment of them is concerned, it would be well to remember that Miller's theory was founded on a very simple experiment. Miller placed extracted teeth in a fermenting mixture of bread and saliva and found decalcified effects upon some of the teeth. Lactic acid was formed. The full explanation of caries was believed to be disclosed. I do not think however, that Miller himself believed that he had entirely explained its cause. Why do teeth decay more in pregnancy? We as a profession have failed to obliterate caries according to the fermentative theory. It is gratifying to me to have Dr. Grieves come around to point where he thinks that a lack of calcium or of phosphorus is concerned with the cause of caries. I agree with him that insufficient calcium has a great deal to do with the underlying causes of this most prevalent pathological condition. We cannot build any structure without the building stones. In addition to this, as I have just shown, we must have certain food substances that induce the system to utilize the calcium furnished. These statements I have repeatedly made for the last two or three years.

Dr. Grieves bases his ideas on the study upon rats which has been going on at Johns Hopkins for some time. I have worked on guinea pigs and monkeys for these animals show the effect of certain food deficiencies in its relation to calcium that are common to man but which cannot be seen in the rat.

The effects that have been obtained upon the teeth of animals must be regarded as a distinct advance over the effects upon extracted teeth in a test-tube and I think that this experimental work together with what we have learned about caries from observation gives us grounds for advocating first of all that infants be fed on mother's milk; when this is poor, an attempt should be made to improve it. When cow's milk is substituted, complications begin. For one thing, the clotting of cow's milk incases the calcium or a part of it and it is excreted, not wholly utilized. When milk is sterilized it must be supplemented with orange juice. When the child becomes older he should still take ample amounts of milk, and also whole grain preparations, together with plenty of green leafy vegetables and citrus fruits in addition to his regular diet. In this way will be furnished those elements which are lost by cooking, drying, refining, long keeping, fractioning or pasteurizing food, viz.; calcium and those factors which induce a proper utilization of calcium.

Dr. Grieves (closing): I am not an authority on diet, but from what I have read and heard, neither the bovine nor human mother can synthesize, out of a defective diet, the necessary elements for the building of bones and teeth. This catalytic factor, or fat soluble A, is essential in the food and blood. If you feed the cow mother or human mother on a diet that lacks fat soluble A, and is deficient in calcium or phosphorus, you cannot expect the mother to furnish good milk for any very long period to the child or the calf. That certainly accounts for the fact that rickets or tetany so frequently follows when children are fed deficient milk from the cow or human mother.

A RATIONAL METHOD OF APPLICATION OF PORCELAIN IN THE RESTORATION OF INDIVIDUAL TEETH

By W. D. VEHE, D.D.S., Minneapolis, Minnesota

(Read before the Odontological Society of Western Pennsylvania, Pittsburgh, November 18, 1922)[1]

THE application of porcelain in dentistry is ever widening in its scope. All branches of restorative dentistry today find its use not only indispensable but also entirely unparalleled in its artistic possibilities.

Fauchard, that man of vision, was perhaps the first to call our attention to the wonderful possibilities of porcelain in dentistry. It is Duchateau, an apothecary near Paris, who is credited with first making a practical application of it. From this rather unsatisfactory beginning, its beauty and artistic possibilities have captivated the profession and inspired it to further efforts. At a period not so far distant and which is remembered by many of you, I am sure, such enthusiasm was manifested in porcelain that it became a common procedure in the hands of the profession with the disastrous results, that we have not yet forgotten. This unfortunate condition was followed by one equally unfortunate when it fell into disrepute even more quickly than it had arisen. At the same time this produced a skepticism relative to its worth in the minds of many that has not even now been entirely dispelled.

From the very beginning, the outstanding quality of porcelain has been that of esthetics and, in spite of its disadvantages, this quality has been sufficient excuse for it to remain before the attention of the profession, so that today this one quality is the chief reason for its present development. Were it not for this wonderful possibility or quality, porcelain would never have had a place in our list of filling materials. It is fitting at this time to pay tribute to the late Dr. C. H. Land. It was he who first applied the metal matrix and with it revolutionized porcelain technic, and likewise, a little later from his fertile mind came the veneer crown.

The survival of this art, and porcelain is the fine art in dentistry, has remained with a few brave men whose judgment and vision convinced them of the applicability of the material. Due to the former experience the profession had in its use, and that it is friable and demands so much from the operator, its use in the profession remains unique in that the rank and file have not dared to touch it. This condition may, however, not be true much longer, for while it still is in the hands of the few, there is distinct evidence of its being accepted by a larger proportion of the profession. This acceptance now has been both slow and careful and it bespeaks for it a healthy growth that is founded on a more mature experience and judgment. This is as it should be, for the material has a definite place in our procedures in which it is equaled by no other. It is para-

[1]Also read before the First District Society of Detroit, Michigan.

mount in this field and it has no imitator that is worthy of much enthusiasm.

At this juncture, let it be understood that by the restoration of individual teeth with porcelain is not meant the use of the Logan, Davis, or Richmond crowns but the individually carved porcelain restorations comprising either a part of or the entire crown portion of a tooth. This naturally then restricts the subject to the porcelain inlay and the veneer crown.

In reviewing the dental literature of the past, since the wave of enthusiasm, it must be observed that the porcelain inlay has received but scant attention. When one recognizes its popularity with the profession during this time no more could be expected. The status of the porcelain inlay today is practically what it was fifteen years ago, and there has been no important change in the technic in that time. Much was hoped for from silicates and now that these materials have proven themselves to be of but limited use, our attention again reverts to the porcelain inlay for a restoration of more permanence.

In the consideration of the porcelain inlay, it might be asked what is the present status of it. This perhaps might well be stated as follows: the porcelain inlay does not have the standing that the veneer crown has justly earned for itself. Neither is it so extensively used in our restorations and it is confined to even fewer operators. This status does not seem to hold true in Europe, especially in certain sections where the display of gold in the mouth is considered so very objectionable. It is true that in America this desire for the esthetic is not sufficiently developed even in the eyes of the profession. That there is a definite place for the porcelain inlay will not be denied by the progressive members of the profession and yet too much gold is displayed and too many teeth are rendered conspicuous and unsightly and where this is not true, there will be found silicates and cements in all of the different stages of imperfection. This is so prevalent that one can see but few cases where this condition is not evident.

This present condition seems to be due to a number of reasons but mainly to the exacting requirements that porcelain imposes on the operator. The color difficulty is a difficulty, and the future possibility of marginal discoloration and breakage have forced themselves to the attention of the operator with seemingly the same conclusion.

The color difficulty has always been a serious problem not only in the inlay, where it is most acute, but also in the veneer crown, and as long as we have not a reliable translucent cementing medium, it perhaps will continue to be. The discoloration of the margin, so often seen around an inlay, is due to the harboring of debris in the margin left open by the disappearance of the cement. The closer and more accurately this marginal fit can be, the less likely will it be to discolor, and since this margin cannot be entirely eliminated in the inlay even by the closest and most accurate adaptation, it, at the worst, can be made so it is not objectionable.

Friability need only concern us where the forces of mastication are applied directly and in certain areas of the mouth this need not be considered. The one surface cavities then, whether on the labial, buccal, or proximal surfaces, are most always favorable to restoration with porcelain and there seems to be no good reason for the use of the silicates in these areas when permanence is desired, except perhaps in the very small cavities where it does not come into contact with the soft tissues. In the two surface cavities where the incisal or occlusal surface is involved, the condition is not quite so favorable to porcelain generally. In these cases the forces of occlusion must be studied on the one hand and the placing of the margin, the anchorage, and the bulk of porcelain on the other. Per-

haps I can intelligently state my position in these cases when I say that the margin of the inlay should be placed, whenever possible, where direct stress will not be applied. Never should shallow or thin pieces of porcelain be subjected to this stress and be expected to withstand it. A certain bulk of porcelain is necessary to insure sufficient strength in the filling and when these requirements are observed, it is truly marvelous what abuse such fillings will tolerate. When this is not observed, however, there is apt to be fracture of the margin or of the mass, in fact, in many of these cases it is sure to be. In cavities involving the incisal margin of the anterior teeth, whether upper or lower, and when these teeth are narrow or thin and there is a decided overbite with an active occlusion up to and including the incisal margin, the chances for a successful and permanent restoration are not good, especially where the extreme muscular force of the jaws is evidenced by an extreme abrasion of these surfaces of the teeth, such an operation should not be attempted except where sufficient bulk and proper marginal protection can be obtained.

In the posterior teeth where the occlusal surfaces become involved, the same reasoning applies. A sufficient bulk of porcelain in the restoration with the margin protected will give excellent service but such an operation cannot fill one with confidence except when well selected.

The status of the veneer crown is more definitely established in the minds of the profession. Its superior strength and less limited indication has encouraged its greater application in the desire to imitate nature. There is hardly any area in the mouth where this crown cannot be used with comparative safety. As it possesses the highest artistic possibilities as its chief indication, but because of the friability of all porcelain, it would rarely be indicated in areas beyond where the esthetic quality required its use. Here as in the inlay, bulk of material is synonymous with strength.

The one condition that the operator must bear in mind always is that of a perfectly balanced articulation with the restoration and the immediate area at least. This is a supremely important requirement for all restorations in porcelain, whether they be an inlay or a crown, and not only must this requirement be complied with before the patient is dismissed but the occlusion, not only in centric but also in eccentric, should be inspected at intervals and corrected if necessary.

The color problem is our most difficult problem and I propose to treat it more in detail. Not only is the operator in porcelain required to work with a most exacting technic, but no matter how accurate may have been his procedure, if in the end, it does not vindicate its presence when the work is placed, it is worse than a more bold restoration of metal and is a failure. In striving for an accurate result, the operator assumes a technic that is without error. Likewise in striving for an accurate color simulation the technic must be equally as exacting and without error, for the color problem is as scientific as is any other part of the procedure. A guess with a hope that the color will be right is based on as good logic as is a speculation with the technic with the hope that the margins will be correct. In neither instance is it desirable or necessary to handicap a final result by such a careless and unscientific process. There are so many factors that enter into this phase of our subject that in a consideration of it, it is well for us to begin with fundamentals. In fact it is well for us to clearly understand again the phenomena of color.

Sunlight is the source of all color. It is also the most perfect light because it is a white light composed of the color rays of all of the colors. As color concerns us in our work, it is produced by

the throwing back or reflection of certain rays of light that are not absorbed by the object that we look upon and these reflected rays are perceived by us as a color. That is briefly the physical manifestation of color as it reaches our eyes. The color that is interpreted or perceived in our visual centers is dependent on several conditions:

First, on the kind and intensity of light which illuminates it; second, on the phenomena which take place in the object or body itself; and third, on the individual peculiarities of the eye which views the body.

Without going into the subject too minutely I will undertake to treat it under these three phases just enumerated.

The kind and intensity of light which illuminates it: Sunlight is our greatest source of illumination and therefore is the standard light under which we judge the color of an object. All other sources of illumination are not as perfect because they have not a mixture of the light rays to produce white light and the color manifestations of an object would not be the same as that produced by the sunlight. Neither would the same object appear of the same color under the different lights except where the lights were composed of the same combination of rays. Under each different illumination then, we would expect to perceive the color of an object as being different except where the lights are made up of the same rays. The reason for this difference is perhaps due to the absence of certain light rays in the illuminant which in consequence cannot be reflected by the object. The intensity of the light likewise makes a difference in this way. Increased intensity of illumination will render colors lighter and finally as white toward the red end of the spectrum and as gray toward the blue end. Decreased illumination has the opposite effect in that colors are rendered darker and finally as black. There is still another influence that can be included here; where the source of light becomes contaminated so to speak by the reflection of light rays from nearby objects thereby including their characteristic color rays with the light.

The phenomena which take place in the object or body itself is of the most complex nature and I shall make no attempt to treat it fully even if I were able except as it concerns our immediate subject. Very briefly it includes every conceivable condition that may be found in an object or a body that will influence or divert the rays of light from their otherwise natural path and includes the reflections, refractions, and absorptions of these light rays. The foremost quality observed in an object is its characteristic color, produced of course, by the colored rays that are not absorbed but are reflected. This quality is influenced by many conditions such as the opacity or transparency of the object, its thickness, its surface condition; that is whether it is smooth or uneven and the nature of this unevenness and many other factors that become very complex. The same object may be made to appear differently by alternating its surface conditions. The polishing of the surface makes it appear lighter and of increased brilliancy, while roughening the surface makes it appear duller, darker or more opaque. The thickness of a body determines its characteristic color also and this is not true of semi-transparent or opaque bodies alone for some of the metals when beaten into very thin sheets assume a different color. Porcelain partakes of all of these qualities.

The third factor, the individual peculiarities of the eye which views the object or body is largely psychological. It is conceded that about five per cent of the population possess a color blindness of the varying degrees. These individuals then cannot hope to perfect their color sense and any dentist suspecting such an impediment in color vision should have a proper examination made

by a competent oculist or optician. One who is handicapped with some form of color blindness cannot hope to be accurate in the perception of the colors he is blind or partly blind to. A normal eye cannot discern the finer gradations of color without training and close attention. We only see what we expect to see or that which we have trained our senses to look for.

The psychological difficulties that a normal eye will encounter in viewing colors are what we know as contrasts and after-images. When two colors are placed in juxtaposition, when they are complements, each will appear more brilliant especially at the line of junction. When these colors are not complementary to one another, then the effect is just the opposite in that they appear duller or even grayed. This phenomenon is understood as being a simultaneous contrast.

The after-images are ascribed to a fatigue of the retina and are differentiated as successive and mixed contrasts. These effects can be seen by first looking at a color for a short time and then immediately looking upon a neutral or white field when an image the size and shape of the color sheet viewed will be seen not of the color view but of its complementary. This phenomenon is the successive contrast. When this same color is viewed again and the eye is then rested on another color that is not the complement of the color viewed, there will be an after-image as before superimposed on this other color with a resultant mixture of the two. This is known as a mixed contrast. From this you will again comprehend that our interpretation of what we see is not always correct or as it really is.

From this concise and perhaps meager color study what deductions can we make that can be a direct help to us in our difficulty? What bearing does it have on the definite selection and interpretation of color in our porcelain restorations? It is of course apparent to us that an understanding of the theory of color and the law of color contrast alone will no more make our color results perfect than will alone an understanding of the technic of the operation. It requires a persistent and perfect application of the technic to insure a proper operation and the application of the color technic must be as persistent and perfect to obtain a right result.

It is evident, of course, that because color is dependent completely on the amount and kind of illumination that a diffused light of an intensity such as the patient is seen in averagely is the first requirement. It is better that the light be diffused because the different hues of orange cannot be so easily differentiated in direct sunlight. Reflections from objects near by like colored buildings or walls must be recognized. The placing of the patient in relation to the source of light must not be overlooked. The upright position is, I think, the best position for the patient to remain in for this part of the procedure. The tooth from which the color selection is to be made should be free from stain and discoloration on the surface and all discoloration caused by decay removed. The tooth should also not have been dried just previously for any length of time.

From this point the actual selection of color can be proceeded with and it is here that the psychology of color vision may exert its influence. In viewing the gingival color which is of an orange hue in juxtaposition to the gum tissues and especially when these tissues are decidedly red, the tendency will be to see the orange as being of a lower tone and if it is light in tone, to actually perceive it as having a green tinge. No tooth is ever colored green by nature and yet some of our manufacturers have interpreted them as such. The incisal or occlusal color presents a very similar problem in that the enamel which is superimposed over the gingival color, may appear as blue. This can be a

natural sequence to viewing a gray light color placed aside one of orange. These influences must not be overlooked and another point which is very necessary to constantly bear in mind. This point is the ease with which the retina tires when viewing colors. Under no condition should we view these colors intently for any length of time without taking intervals of rest because of this tendency of the retina, for when this occurs, it is entirely impossible for us to discern the finer gradations of color. After-images are caused by retinal fatigue and when the color examination is persisted in there is a progressive tendency to see it more gray.

In the inlay more than the crown, after cementation of the same, the light reflecting and absorbing quality is changed by this cementing medium. This effect is different where the inlay is in bold view from what it is when somewhat concealed as on the proximal surfaces. This difference is perhaps due somewhat to the refraction of some of the light rays or rather the difference in refraction and only a cementing medium that is equally opaque and of the same color will prevent this. This is at times a great disappointment to all of us who have done this work.

The interpretation of these colors in our porcelain bodies is not without its pitfalls. It first of all requires that we be masters of the colors we work with. Our color guides must be accurate and the guides as are furnished us by the manufacturers of the porcelain generally are not. It therefore becomes necessary that a correct color guide be made or obtained, and whenever a new portion of porcelain is begun it is best to at least verify its color before using it. It is unfortunate that different portions of porcelain of the same color and made by the same manufacturer are not always of the same color and when this is not recognized there is bound to be error.

My observations make it evident to me that many of our color mistakes are due to our not accurately seeing the color as it is represented in the tooth. When we add this error to any inaccuracy of interpretation in our porcelains, we should not be so surprised to behold so bold a monument to a lack of proper attention.

In conclusion, permit me to state that until a material is brought to our attention that has not the disadvantages of porcelain and that will lend itself as readily or more readily to the esthetic requirements in the hands of the average man, porcelain will not be displaced from its proper field. It is not the purpose of this paper to misconstrue the indications for porcelain in our restorations but rather to aid in its placement where it rightfully belongs so that more of us can render our patients a superior service. The development of the esthetic quality on the part of our patients is very evident and we will be called upon to make this quality a greater consideration in the future.

That porcelain demands so exacting a technic, should not be spoken of as a disadvantage, for a technic such as will create a confidence for uniformly accurate results can be developed with proper application even by the average man. There must, of course, be a perfecting of oneself before one can pretend to even moderate success and there must ever be a conscious effort toward a constant, accurate technic for results such as we should demand of ourselves.

TISSUE BEARING PARTIAL DENTURES AND UNILATERAL SADDLE REPLACEMENTS

By R. W. HAYWARD, D.D.S., Los Angeles, California

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THE purpose of a partial denture is, of course, to replace those teeth which have been lost—to restore lost masticating efficiency, and in so doing, it automatically relieves the remaining natural teeth from over-function. A partial denture, then, is of the first importance; it not only replaces those teeth which have been lost, but it is also an aid against further loss of teeth.

The subject is a big one, and probably furnishes the profession with the greatest problem it has to face today. A clever method of taking partial impressions, the design of a bent wire or some unique retaining agent, will not solve the question. It is estimated that the average dentist constructs ten partial dentures in a year, which would make a grand total of almost half a million partial dentures constructed annually in the United States. It is probably safe to say that not more than five per cent of this total are really efficient restorations. The patient is told not to expect too much, that partials are only makeshifts, that they will eventually graduate into larger partials or full dentures. The retainers are moved ahead a step and two more teeth added to the old denture. Or when the partial is a posterior restoration, and most of them are, it is seldom indeed that the anteriors do not show traces of pyorrhea due to trauma or over-function.

It is one thing to make a partial denture, and quite another thing to make a partial denture that really takes the place of those teeth which have been lost. A partial denture can be a true restoration, or it may merely fill a void; be worn by the patient, but not used very much for masticating purposes. How often can you insert a partial denture and have the patient go right home and eat a meal with comfort? Not very often. The patient must learn to wear the restoration; must learn to be able to keep it in position at meal time without using it very much. The patient does not learn how to use it, but how to keep annoying pressure from it. The result is, most of the mastication is placed on the remaining natural teeth, usually single-rooted anteriors and the inevitable result is the loss of those teeth.

I shall attempt to lay down a definite technic for the construction of partial dentures that are real restorations. But unless the fundamental principles governing the work are understood, any technic I have to offer would be like a book in the hands of a man without sight. As I shall prove to you, the progress of partial denture work has been impeded because of a lack of knowledge of the fundamentals. It is a fact that some of the technic being taught today is based upon ridiculous fallacies. I believe a knowledge of the true fundamentals to be more important than the technic to follow, because when these

fundamentals are understood, the technic should suggest itself.

Another thing that it might be well to bring up first, is the viewpoint of the dentist toward a partial denture. In making the financial arrangement with the patient, we usually think of the work to be done as the denture itself, something that we can pick up and examine. A vulcanite replacement is so much, and a gold restoration so much more. The viewpoint that we should have, is that the denture is merely an agent which we will use; that the fee is really being paid for increased masticating efficiency; for a longer lease on life of the remaining natural teeth. When we have that viewpoint it will not be so hard to obtain a proper fee for the service rendered, and it is possible we will take more pains to see that the denture does aid in mastication. Let us look beyond the mere mechanical piece to the service it shall render. Let us render professional services, and not be sellers of mechanical contraptions.

If the denture we construct is an aid to mastication, force from the opposing jaw will be applied to it. Before we proceed further then, let us prove *on what angle this force is applied,* and *the effect of the force on the mucosa.* In the first place, in the mastication of food we do not eat with a straight up and down, or opening and closing movement. We take advantage of the law of cleavage, which gives us a cutting force, instead of the crushing force the straight opening and closing movement would give. We use a slight lateral movement in normal mastication, the average mandibular movement being probably about one millimeter. Further, it is natural to place definite pressure on one side of the jaw at a time; that is, the right side may exert forty pounds pressure, while the opposite side may only use twenty pounds. It is true that we fairly evenly distribute the food on each side of the jaw, to more thoroughly incorporate the saliva, but *it is not natural to apply the same amount of force on each side of the jaw at the same moment.* In the chewing of gum, we do not cut the gum in two parts, having a bolus on each side of the jaw. If a ten-year-old boy had an entire package of gum in his mouth, he would maintain it in one bolus, and he would not attempt to chew on each side at the same moment. Many of us have a favorite working side, and will do a majority of our masticating on the right or the left side, as the case may be.

The force of mastication, then, may be applied at many different angles. In normal mastication, with a lateral movement of the mandible, there will be a lateral force applied. The inclination of the teeth, or the angles on which they are placed, together with the occlusion, has a great deal to do with the angle on which this force will be applied to the mucosa. The amount of food, and the position in which it is placed, will also have a bearing. Finally, it must be remembered that this force is transmitted to the mucosa, by means of the denture, and the force as it is finally applied will be in harmony with the movement of the denture. And further, that the denture can only move to the extent that mucosa is compressible, and that for that reason, the movement of the denture is really in harmony with the compressible or displaceable condition of mucosa. And as all mucosa is compressible, and as some ridges are firm while others are soft and flabby, it is quite evident that force may be applied to the jaw from every conceivable angle.

I have spent some time to prove this point, as it is very important to remember *that force may be applied to the mucosa from almost any angle, and it is quite impossible to determine in advance on what angles force will not be applied.*

What is the effect of this force on the mucosa? We have all seen hypertrophied tissue as a result of pressure. We have seen where this force has broken down the process. We have seen where

pressure due to over post-damming in full denture cases has caused a great deal of resorption. But each of these three effects is caused by three different types of pressure. In a case where the lower posterior teeth are absent, and the patient is wearing an anterior bridge with the facings butted to the tissue, we usually find hypertrophic tissue around the necks of the butted teeth. This is caused by the constant pressure of the facings against the mucosa at meal time, the absence of posterior teeth placing undue stress on the bridge. This constant pressure acts as a stimulant to blood flow, and the hypertrophy tissue is the result. Or when the posterior teeth are missing below, and an upper full denture is worn, it is common to find a broken down process and a flabby ridge. All the force of mastication being applied by the anterior teeth, the denture is caused to "*dig-in*" at the labial edge, and a pounding pressure over a small area is applied to the ridge. The result is a broken-down process, and an excess of tissue or a soft flabby ridge. While the pounding pressure of the edge of the denture causes a breaking down of the process, the same pounding pressure acts as a stimulant to blood flow and results in the soft flabby ridge. Another type of pressure is found in the over post-dammed denture, which soon becomes loose. This is a continual pressure, which by interfering with the free flow of venous blood, also retards the flow of arterial blood, and the blood supply cut off, immediate resorption is the natural consequence.

Continual pressure or pressure that interferes with venous blood flow will cause resorption.

A massage movement over too small an area, such as facings butted to the mucosa, will cause an oversupply of blood and hypertrophic tissue.

A pounding pressure over too small an area will cause a broken down process, and often a soft flabby ridge.

But if this pounding pressure is distributed over enough area it will not cause a noticeable breaking down of the process, but it will act as a stimulant toward a normal flow of blood and tend to maintain a normal condition of the process and the tissues overlying it. With proper articulation and good fitting full dentures, we have very few flabby ridges or cases of broken down process.

The first principle then in partial denture construction is to so design the restoration that it will distribute the stress of mastication over as great an area as possible.

At this point it may be well to ask, shall we make the denture tissue bearing; why not make it tooth bearing; or why not divide the stress between the abutment teeth and the mucosa?

It is a fixed principle that it is impossible to obtain a bearing upon a yielding object. The average displacement or compression of mucosa under pressure is one-half millimeter. A few pounds pressure will cause the maximum compression. For the purposes of mastication, then, mucosa does not afford a bearing, until it is thoroughly compressed. I have here two unyielding blocks and one block of yielding material, a soft rubber sponge. I now place the soft rubber sponge between the two unyielding blocks, and in contact with all three pieces I have a piece of wood over the top. When I press downward on the piece of wood, the soft rubber sponge is not compressed, and yet just a few ounces pressure would displace it for at least half an inch. It is quite evident that the soft rubber cannot be displaced unless the piece of wood moves downward, but it cannot move downward. In other words, no pressure can be applied to the soft rubber sponge until it is thoroughly compressed, and until it is compressed it cannot give a bearing or support to pressure.

Now if you will use your imagination a moment, we shall see how this applies to denture and saddle cases. The soft rubber sponge will represent the mucosa, and the blocks at either end as two abut-

ment teeth. The piece of wood will represent a restoration, such as a cast clasp saddle case, with a clasp definitely resting on each tooth. The clasps cannot move toward the gingival after they are properly seated to position, and for that reason the saddle cannot move toward the tissue. This proves that the effect of such a saddle case is the same as I have here, the saddle is merely in contact with mucosa, it is not bearing upon it and all the stress is applied to the abutment teeth. I repeat, it is a fixed principle that it is impossible to obtain a bearing upon a yielding object, and the saddle that cannot move in harmony with mucosa compression, cannot possibly place any stress on the mucosa. And that is the reason it is physically impossible to divide stress between the abutment teeth and the mucosa.

On the other hand, let us suppose that the saddle can move in harmony with mucosa compression, would that divide the stress between the mucosa and the abutment teeth? Of course not, the saddle having free movement with the displacement of mucosa, it would be one hundred per cent tissue-bearing, and no stress would be applied to the abutment teeth. It has been suggested that the saddle be limited in movement, that it not be allowed to move to the full extent of mucosa compression, and in this manner the stress would be divided between the mucosa and abutment teeth. But as long as the mucosa is not thoroughly compressed it does not offer a bearing, and as we have seen, it will be impossible to place any stress upon it.

As I said at the outset, a great deal of our trouble in partial work has been caused by our lack of knowledge of the true fundamentals and because some technic now being taught is based upon fallacy. One of the most common mistakes is the attempt to secure a bearing upon a yielding object. I have already repeated that—it is a fixed principle that it is impossible to secure a bearing upon a yielding object, and as a final proof that it is physically impossible to divide stress between yielding mucosa and abutment teeth, I also quote—it is a fixed principle that stress cannot be divided between yielding and unyielding objects. As long as mucosa can be compressed to the full extent of its compressibility, at a few pounds pressure, it will remain a *very yielding object,* and we might just as well try to stop the earth from moving around the sun, as to attempt to obtain a bearing upon it in its normal state.

I believe you will all agree that these premises prove that a denture or saddle must either be tissue-bearing or tooth-bearing. In very short spans, where pressure is too great for the small area a saddle can cover, tooth-bearing pieces would be indicated. The problem we have, is how to make the longer span tissue-bearing, because the yielding mucosa does not afford a bearing for the saddle or denture.

We all realize that if the mucosa were not compressible, if it were absolutely unyielding, the saddle or denture would have a bearing. Following this reasoning, it has become a common practice to obtain what is termed as a biting stress relation. The saddle or denture being seated in position in the mouth, and sufficient pressure placed upon it to compress the mucosa, and while held in that position with the mucosa compressed, a plaster connection is made between the denture and the abutment teeth. The result is that when the denture is completed and inserted, it will continually compress the mucosa and have a bearing.

It is generally known though, that a continual compression of mucosa causes resorption. This is proven every time an over post-dammed full denture is inserted, from a very tight fit we have a very loose fit in just a few weeks, usually in less time. If atmospheric pressure can cause enough mucosa compression as to result in such resorption, what can be expected when two rigid fitting r taining agents are maintaining even

more displacement of mucosa? Or let us admit that such pressure will not cause resorption, we are, nevertheless, faced with the fact that to the extent that the saddle or denture is using force to maintain the compression of mucosa, so to that extent must the pressure be upward, or lifting on the abutment teeth. In the use of the biting-stress relation in connection with rigid fitting retaining agents, we automatically create an abnormal condition in the hope of obtaining a normal condition. It is safe to assume that within thirty days' time, resorption will remove the very last trace of a biting stress relation. This brings us back again to the beginning, and once more proves that we must use the mucosa as it is, and the only way a saddle can be made tissue-bearing, is by allowing free movement of the saddle in harmony with the mucosa displacement.

So far, then, we have proven the following to be the true fundamentals in the construction of tissue-bearing partial dentures. Force of mastication should be distributed over as much area as possible.

Denture should have light contact with mucosa and not cause constant compression.

Denture must have free movement in harmony with mucosa displacement.

As force is applied to the denture on many different angles, it must have freedom to move on all possible angles toward the jaw.

To the extent that these fundamentals are ignored, so do we have failure in partial denture work, and when it is realized that the majority of partial dentures are made without any regard to these essentials, it is no wonder that the average partial denture is an absolute failure. As has been proven, the yielding mucosa does not afford a bearing, and for that reason all extension saddle cases or dentures with a free end, as when the molars are restored, are *first class levers from the moment of insertion.*

It has been popularly supposed that the denture does not act as a lever until after resorption has occurred, but in fact, it is a lever from the moment of insertion when it is rigidly connected with the abutment teeth. To compensate for mucosa compression, retaining agents have been devised which are supposed to allow the denture to move in harmony with this compression. But most of these devices allowed movement on one angle only; a straight perpendicular movement toward the jaw. As an illustration, take a pin and tube attachment, which is supposed to allow movement toward the jaw, but no movement away from the jaw. If it really functions as it is supposed to function, the first time the jaws close in a masticating effort, the tube would move toward the jaw with mucosa compression, *and then stay there, because it does not allow movement away from the jaw.* This would cause a continual compression of mucosa and resorption. The chief fault with such a device though, is the fact that it does not allow for the important lateral movement of the denture.

Other devices have been designed with a view toward allowing for the lateral movement, of which the ball and tube is a good example. While the ball can rotate within the tube, which would allow a saddle to rotate, it cannot move laterally and naturally it does not allow the saddle to move laterally. Suppose, however, that we have two such attachments on a lingual bar case, as one saddle rotates the opposite saddle must move in a circle. But the ball cannot move away from the tube, it can only rotate within the tube. For that reason, when two such attachments are used on a denture, the denture cannot even rotate, and the important lateral movement is impossible.

In short, the trouble has been that we have made a vain effort to create a device that would allow freedom of movement toward the jaw, and no movement away from the jaw. And as we have already seen, when we do secure such a

device, and it does move toward the jaw, it cannot move away and causes a continual compression of mucosa, irritation and resorption.

While all these devices have proven failures, we did not know exactly the reason why. When a tooth carrying such an attachment was lost, the crown or the inlay usually received the blame for the trouble. No thought was given to the leverage placed upon the tooth; as a matter of fact, I will wager that ninety per cent of dentists have a very hazy idea of what this leverage can do. The trouble caused by leverage was usually attributed to a faulty crown or inlay. So when the cast clasp was introduced, it was thought that our troubles were over; we had effective retention without the use of a crown or inlay. But we have just as much trouble with the cast clasp as we had with the manufactured device, and not having a crown or inlay on the tooth we now know it is leverage that makes the tooth *"sore and sensitive."* When we used the manufactured device and the tooth became sensitive, the inlay was removed or the trouble laid to a faulty crown.

When the fulcrum is between the weight-arm and the power-arm, the lever is of the first class. The cast clasp pulling on the tooth becomes the weight-arm, the denture receiving the force from the opposing jaw becomes the power-arm, and that part of the clasp which is next the denture and resting or bearing on the tooth becomes the fulcrum. Thus a partial denture exerts the power of a first class lever on the abutment tooth. The mechanical advantage of such a denture-lever, depends upon how rigidly it is connected with the abutment and upon the length of the denture. The average partial denture supplying two molars and bicuspid has a mechanical advantage of at least six. That is, if twenty pounds' pressure were used in mastication, this twenty pounds would be multiplied six times when placed on the abutment tooth. And this pressure is applied to the abutment at an angle, an exaggerated traumatic force. The abutment tooth is moved on the angle at which the force is applied, a tipping movement away from the jaw at an angle. Thus the periodontal membrane is crushed between the root and the alveolar process. At the crest of the process, the movement of the tooth created a wedge effect, and the membrane is caught in this wedge, and subjected to the full force of leverage exerted by the denture. Is it any wonder then that the abutment teeth become "sore and sensitive," rotated, loose, and many cases are lost?

Another objection to the cast clasp, is the danger of decay caused by the forming of acid beneath it. Some men answer this by showing that if a tooth is kept clean, there will be no danger of decay. But we cannot very well guarantee that the tooth will be kept clean. Others again answer the question by stating that they would prefer to use a small amalgam filling after decay takes place, than to cut a large cavity in a sound tooth and use an inlay for retention.

It is generally agreed that when the danger of leverage and decay is removed, the cast clasp offers the ideal retaining agent in many prosthetic restorations. The danger caused by leverage has been removed by the various shock-absorbing devices and the danger of decay is largely eliminated by a new type of cast clasp which I am glad to be able to show.

Among the shock-absorbing devices we have various types of spring wires. While these wires are used in different ways, some being straight and others curved or bent in a gooseneck manner, the principle in all is the same; the wire acting as a connection between the denture and the retaining agent. To the extent that the spring of the wire allows movement, so can the denture move with the displacement of mucosa. There are several objections to the use of the shock-absorbing or compensating wire, chief of which is that ofttimes it becomes bent or its relationship is otherwise in-

correct. When this happens, the spring wire is under continual tension and will act as a regulating appliance. Sometimes the soreness of the abutments is removed, after the teeth have been rotated sufficiently to compensate for the loss of relationship in the wire. Another objection is the frequent breakage, a natural result of the strain and movement the wire is called upon to bear.

The Dresch attachment or stress-breaker, while doing the work of the spring wire, overcomes the objections to the spring wire. There is no danger of its acting as a regulating device, and as stress is not applied to it, there is no danger of breakage. I have myself inserted upward of forty dentures using this device, and I have found that it not only removes all masticating stress from the abutments, but that it goes a great deal further. It automatically removes binding of any kind, and the tight fitting denture is comfortable immediately after insertion. It allows such a range of free movement toward the jaw, that I have been able to insert cast clasp dentures where the abutments stood at such conflicting angles, that the case would have been a failure without the device. And after the insertion of the denture, on account of the absence of mucosa irritation, there is very little after-trimming to do, and I have had quite a number of dentures that were never removed except for cleaning.

Now let us repeat what we have proven to be the fundamentals in partial denture construction:

The force of mastication should be distributed over as much area as possible.

The denture should not cause constant compression of mucosa.

The denture must have freedom to move on any angle toward the jaw.

By using the Dresch attachment it is possible to meet these requirements, and still have a tight fitting denture. I have one of these devices which has been made greatly oversize. It is composed of two pieces, which are locked together. One part is fastened to the denture and the other part to the retaining agent. When the two parts are in proper relation, and the denture is in position in the mouth, that part of the device which is fastened to the retaining agent, will be stationary. The other part will have free movement on any angle toward the jaw, but no movement away from the jaw. The effect then, is that while the denture is tight, in sense of feeling to the patient and effect upon the jaw, it is as though retaining agents were not used. As anchored dentures are usually constructed, the movement of the denture during mastication is on certain lines only, and the force of mastication is placed upon a limited saddle area. But with this device, the saddle or denture has absolute freedom of movement toward the jaw, with the result that the pressure is distributed over the entire saddle area, resulting in less resorption and irritation.

But this device in itself does not make a successful partial denture, any more than a Chayes attachment makes a successful bridge or Trubyte teeth will result in a successful denture. Such things as the articulation, the impression, the relation of the retainer to the denture and the application of the stress-breaking device itself must be right.

THE DIFFERENTIAL LEUCOCYTE COUNT IN CHRONIC PERIAPICAL DENTAL INFECTION[1]

By RUSSELL L. HADEN, M.D., Kansas City, Missouri

AT THE present time the radiograph is necessarily the main dependence in the diagnosis of chronic periapical dental infection. Clinicians and dentists agree that patients suffering from systemic disease of focal origin should have removed all teeth which may be a source of infection. There is a great difference of opinion, however, as to what should be done with pulpless teeth which are negative in the radiograph, and even with teeth which show evidence of infection, in the absence of systemic disease. The problem is of great concern to both the physician and dentist. It is of special interest to the dentist since the patient presenting himself to him is so often not suffering from systemic disease, while the reverse is true of a patient coming to the physician.

The criteria of systemic disease are relatively crude and the physical signs relatively gross. Great damage may be done to body tissues before the changes are serious enough to be recognized by the usual clinical methods. It is apparent that foci which are causing general damage should be removed early as a preventive measure. Some diagnostic sign which would enable us to determine whether absorption is taking place from infected areas in the absence of systemic disease would be of the greatest value in indicating the proper procedure to follow with pulpless teeth. Such teeth may be negative in the radiograph and yet be infected since there must be many bacteria present before sufficient bone destruction takes place to show in the x-ray. On the other hand teeth around which there is evident bone destruction may have become sterile and thus be harmless from a systemic standpoint.

Attempts have been made to determine toxin absorption from infected foci by the complement fixation method. Mixed cultures or organisms isolated from periapical infection are used as an antigen. Such procedures have yielded little information of value. A study of leucocytes of the blood would seem to be a more promising method of approach, since the white corpuscles may respond quite rapidly when bacteria or products of bacterial activity are absorbed by the blood.

Hecker states that he has observed tinctorial changes in the leucocytes in the presence of dental infection (1). Logan found a leucocytosis in 47 out of 52 cases of periapical infection (2). Goadby thinks that there is constantly an increase in mononuclears in pyorrhea and systemic disease (3). Daland concludes that "small cell lymphocytosis with a corresponding decrease in the polymorphonuclear cells is an important diagnostic sign of periapical dental in-

[1]From the Deaner Institute.

fection, the value of which is increased when leucopenia exists" (4). This observer considers that lymphocytosis (38 per cent or more of lymphocytes) indicates that toxins or streptococci or both are entering the blood stream. He states that he found a lymphocytosis only twice in 100 cases of chronic disease where no focal infection existed. Toren claims to have found a certain type of leucocyte in the blood indicative of infection about the teeth (5). This cell, he thinks, originates in the lymph glands draining the infected area.

To determine whether we could utilize the findings described by others as a diagnostic measure in chronic periapical dental infection I have made a differential leucocyte count on blood films from 200 patients. The films have in every instance been made on cover glasses, a procedure which allows the drop of blood to spread spontaneously and evenly. It is very doubtful whether it is possible to get a true differential blood count where films are made on slides. No films have been used unless there was a uniform spread of the cells with the red cells one cell thick over an area covering at least eight low power fields of the microscope. On each film 500 cells have been counted, hence the study includes a count of 100,000 cells. I have made all counts.

The films have been made on seven-eighths inch cover slips and stained with Wright's stain as follows: Eight drops of stain are run on the film and left for one minute, eight drops of a phosphate buffer solution of PH 6.4 are then added and left for four minutes. The film is washed with distilled water, dried and mounted film side down in balsam. We have found that the addition of the buffer solution instead of distilled water to the stain gives remarkably uniform preparations and differentiates very sharply the various types of white cells. The granules of the granular cells are brought out especially brilliantly in films prepared in this manner.

In such a study it is apparent that the basis of classification of the leucocytes should be plainly stated. This is not clear in many published reports. Daland, for instance (4), appears to have divided the cells only into lymphocytes and polymorphonuclears. Toren in claiming that there is a peculiar type of cell in infection about the mouth evidently uses a different classification from other hematologists, since he finds in normal individuals only one-half per cent large mononuclears while others agree on six-tenths per cent.

From the standpoint of origin there are three different types of white cells in the blood: (1) polymorphonuclears coming from the bone marrow, (2) lymphocytes, large and small arising in the lymph glands and (3) true monocytes which include both the large mononuclears and transitionals. The origin of the latter is in dispute but the consensus of opinion is that they are of endotheloid origin (6). The identification of the polymorphonuclears is simple. The same may be said of the small lymphocytes. There is a great deal of confusion, however, concerning the relation and differentiation of large lymphocytes and large mononuclear cells. In films stained by the technic described above, the mononuclear cells are sharply differentiated. The large lymphocytes have dark blue nuclei and the protoplasm is clear or diffusely blue. The protoplasm may contain azurophile granules, which are a very dark purple color, are usually few in number and show a great variation in size. The true large mononuclears, on the other hand, have relatively larger nuclei which may be round, indented or saddle bag shaped and usually take a lighter stain than the nucleus

of the lymphocytes. The protoplasm has a ground glass appearance due to the uniformly distributed light purplish blue granules which are very fine and of uniform size. The granular appearance has been ascribed as due to nodosities in the reticulum of the protoplasm but seems more likely due to the presence of true granules.

The classification we have used has the added value that it can be compared with the very complete study of the normal differential leucocyte counts made by Miller (7). Miller includes the large lymphocytes with the large mononuclears and makes separate classification of the transitionals. The lymphocyte group is thus smaller and the large mononuclear group larger than would be when the cells are classified on the basis of origin.

Patients have been grouped as follows:

Group I includes 134 patients who showed evidence of alveolar abscess in the dental radiograph. Since we have proven by culture that many such abscesses are sterile it does not necessarily follow that all the individuals of this group really have periapical infection.

Group II includes 66 patients who showed no definite evidence of infection in a radiograph of the teeth. Of the 66 patients in this group 28 had one or more pulpless teeth. Many pulpless teeth which show no radiographic evidence of infection are really infected, so here again the grouping is rather artificial.

Group III comprises 47 patients who showed, on careful physical examination, definite evidence of systemic disease of focal origin. The diseases included are arthritis, neuritis, iritis, pyelonephritis, duodenal ulcer, encephalitis and endocarditis. All patients had pulpless teeth and 36 had periapical abscesses.

Group IV includes 53 patients who were thoroughly examined and found to have no evidence of systemic disease. Of this group 29 had pulpless teeth and 17 had periapical abscesses.

Group V comprises 23 patients all of which were proven by cultures to have infected teeth. In every case rabbits were injected and the lesion from which the patient suffered reproduced in the animal. There is every reason to believe that the dental infection was the source of the systemic disease. If the differential blood count shows anything typical in focal infection it should certainly be evident in this group.

The results of the differential counts are shown in Table I. The average white cell count in Group I is 8311 per c. m. m.; Group II, 7800; Group III, 8763; Group IV, 7714 and Group V, 8838. The differential count is remarkably alike in the five groups. The average polymorphonuclear neutrophile is 62.2 per cent in Group II and 66.2 per cent in Group V. These are the two groups which one would expect to show the greatest difference. The eosinophiles show much the same variation, being highest in Group V. The basophiles show no change. The lymphocytes show practically the same average throughout the five groups. The average is 26.6 per cent in these patients showing undoubted evidence of disease of focal origin (Group V) and 28.5 per cent in those showing no evidence of infection in the radiograph (Group II). The large mononuclear cells show equally little variation.

Discussion

The results in this series of counts indicate that the patient with alveolar abscesses will have a slightly higher total white count than one who shows no radiographic evidence of infection. If systemic disease of focal origin is present the difference is somewhat more

TABLE I.

GROUP			I	II	III	IV	V
Total Number of Counts			134	66	47	53	25
		Average	8311	7800	8783	7714	8838
			%	%	%	%	%
Total White Blood Cell Count	Distribution of Counts	Over 10,000	11.8	7.5	27.6	9.5	24.0
		8,000-10,000	42.2	33.3	36.2	30.3	44.0
		6,000-8,000	38.5	52.8	29.8	45.5	20.0
		4,000-6,000	7.5	6.1	6.4	15.2	12.0
		Average	64.4%	62.2%	63.9%	64.6%	66.2%
			%	%	%	%	%
Polymorphonuclear Neutrophiles	Distribution of Counts	Over 80%	2.2	1.5	2.5	0	0
		70-80%	23.9	4.2	12.7	40.0	16.0
		60-70%	47.9	34.8	63.8	32.1	60.0
		50-60%	23.9	36.4	19.2	22.7	24.0
		40-50%	2.2	3.0	2.0	5.2	0.0
		Average	1.7%	2.0%	2.3%	1.6%	2.5%
			%	%	%	%	%
Polymorphonuclear Eosinophiles	Distribution of Counts	Over 5%	3.0	3.0	6.3	0	8.0
		4-5%	3.0	3.0	6.3	0	8.0
		3-4%	8.2	6.1	15.0	9.4	8.0
		2-3%	20.2	30.3	27.7	24.5	36.0
		1-2%	44.8	31.8	25.5	41.5	16.0
		Under 1%	20.8	25.7	19.2	24.5	24.0
		Average	0.5%	0.4%	0.4%	0.4%	0.5%
			%	%	%	%	%
Polymorphonuclear Basophiles	Distribution of Counts	Over 1%	3.8	6.0	10.6	16.9	16.0
		0.4-1%	73.1	72.7	59.5	37.7	28.0
		Under 0.4%	23.1	21.3	29.9	45.5	56.0
		Average	27.1%	28.5%	26.0%	27.5%	26.6%
			%	%	%	%	%
Lymphocytes (large and small)	Distribution of Counts	Over 30%	29.9	45.5	23.4	35.9	28.0
		25-30%	31.3	24.2	25.5	17.0	40.0
		20-25%	21.6	18.2	38.3	24.5	16.0
		10-20%	16.4	12.1	12.8	22.6	16.0
		Under 10%	0.8	0	0	0	0
		Average	6.2%	6.5%	6.5%	5.9%	6.3%
			%	%	%	%	%
Large Mononuclears and Transitionals (Monocytes)	Distribution of Counts	Over 10%	4.5	6.0	10.6	7.5	8.0
		8-10%	5.9	12.1	23.4	9.4	24.0
		6-8%	14.2	21.2	23.4	15.1	16.0
		4-6%	67.2	53.0	19.2	54.7	24.0
		Under 4%	8.2	7.6	23.4	13.3	28.0

Group I. Patients showing in radiograph definite evidence of one or more infected teeth.

Group II. Patients showing in radiograph no evidence of infected teeth.

Group III. Patients with infected teeth and systemic disease of focal origin.

Group IV. Patients with no evidence of systemic disease of focal origin (17 showed definite areas of rarefaction in dental radiograph, 28 had no pulpless teeth, and 18 had pulpless teeth showing no evidence of infection).

Group V. Patients with systemic disease of focal origin which was reproduced in rabbits by bacteria isolated from periapical foci.

marked. This difference is not great enough, however, to be of any definite value in diagnosis and decision as to treatment.

A study of the differential counts shows that the increase in white cells observed is due to a general increase in all types of cells although there is a slight relative increase in the polymorphonuclear cells. There is no relative increase in the lymphocytes and large mononuclear cells. We have found no evidence of any type of cell which is peculiar to focal infection. There is no sufficient clear-cut increase in any one type of cell to make the differential leucocyte count of definite value in the diagnosis of absorption from areas of infection. In fact, the study has demonstrated to us that the differential leucocyte count is of little value in our problem.

Summary

The results of the study of the white cell count and differential count in 200 patients is presented, 100,000 white cells having been counted.

Patients with periapical abscesses show a slightly higher total white count than those having no abscesses. The difference is somewhat more marked in those patients suffering from systemic disease of focal origin.

The increase is, for the most part, in the polymorphonuclears although all types show some increase.

Patients suffering from chronic periapical dental infection do not show typically a lymphocytosis.

We have found no evidence of an unusual type of white cell or tinctorial reaction in chronic dental infection.

The differential count is of little practical value in determining whether a patient is absorbing toxins or bacteria from possible foci of infection about pulpless teeth.

References

1. Hecker, F. *American Journal Medical Science.*

2. Logan, W. H. G. *Journal Allied Dental Society,* 11, 156, 1916.

3. Goadby, Kenneth. *Journal American Dental Association,* 9, 373, 504, 1922.

4. Daland, Judson. *Journal American Medical Association,* 77, 1308, 1921.

5. Toren, Julius A. *Dental Cosmos,* 64, 917, 1922.

PREVENTION AS APPLIED TO RECURRENT DISEASE OF INVESTING STRUCTURES, SUBSEQUENT TO PREVIOUS ARREST

By ELBERT J. WEAVER, D.D.S., Milwaukee, Wisconsin

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A YEAR ago I discussed "Essentials in the Treatment and Care of the Investing Structures of the Teeth Beyond the Preventive Stage." Essentials mentioned and summary were as follows:

Essential 1. Relation of the Physical Condition to the Local Manifestations.—This can be summed up in closer relation between the dentist and medical diagnostician, in conjunction with whom we are attempting to eliminate fields for the production of low grade infection. The mouth is not the only field for production and the local condition may be seriously influenced by other physical ailments.

Essential 2. Occlusion—This is a very important essential and one, which if neglected, will doom to failure the most care-taking application of the other essentials.

Essential 3. Non-Vital Teeth—Any non-vital teeth that we feel sure are a menace to the patient's health should be sacrificed; some sinuses of apparent pyorrheal nature also have their origin in infected root ends. The removal or retention of any non-vital tooth should come down to a question of common sense and good judgment.

Essential 4. Pre-Treatment—We believe that the tissues should be put into a revitalized state before instrumentation is attempted.

Essential 5. Instrumentation — Instruments should be used with a definite technic and mode of procedure; gum resection resorted to where necessary.

Essential 6. Post-Treatment, or After-Care by the Operator—Case should not be pronounced finished until the operator is sure that the surrounding tissues show no inflammation and are hard and firm.

Essential 7. Care by the Patient at Home—No matter how well the periodontist has performed his work, the case should not only stay in the condition in which it was discharged, but it should improve as the years pass, providing this important essential is painstakingly performed by the patien..

These are again repeated in this paper so that with a better understanding, we can take up essentials six and seven which are the basis of the title of this paper.

In every case of periclasia that has received treatment, we must assume that there is a predisposition for its return. Given the same status both physically and locally which brought it about, why would the disease not appear again just as it came the first time? That is our problem.

We will assume that we are dealing with a case where there has been considerable bone destruction, that eradicating and arresting measures have been carried out, and that after considerable effort on our part, quite a period of time having elapsed, we have finally discharged the patient with his mouth in the best condition that it is in our power to obtain—what then?

In dealing with supporting structures of the teeth, if prevention of return is ac-

complished, certain fundamental facts must be borne in mind.

As noted by Talbot (1), "periodontal membrane, alveolar bone, gingiva and gums are in the nature of end organs and are sensitive to circulatory changes." They have been aptly called "transitory structures," called into being long after birth as a means to support and lend beauty to the teeth as they stand in the arch. Later in life, sometimes not so many years later, the teeth have disappeared, these beautiful supporting structures have gone, and the mouth again appears nearly as it did when we came into this life.

The idea of how transitory they are, is brought home to us by thinking for a moment of the percentage of people between the ages of thirty and fifty who are wearing dentures. It would naturally follow from the above facts as to their nature, that they, as well as the teeth, should need and demand exceptional care.

In preventing the return of periclasia, one must know in so far as possible, what were the etiological factors concerned in its inception. Locally, we think first of mechanical irritations or in other words, malocclusion. What does the term "malocclusion" mean? We have in mind an abnormal condition in which we often find the teeth, due to the loss of some of the components in the arch, or by reason of their overcrowding, due to want of orthodontic measures at the time when such procedure was indicated.

Dewey (2) aptly defines it as "the deviation from normal occlusion to such an extent as to interfere with normal functions of the teeth." Such loss of function naturally, as in any other part of the body, would cause irritations. The ordinary irritations such as salivary deposits, rough fillings, overhanging bands, crowns, etc., produce an inflammation which usually becomes infectious in time, but which is not mechanical. The causes of these injuries which produce the inflammation are easy to remove, but malocclusion is another matter. Even when we have leveled and balanced the bite to our satisfaction, spending plenty of time with wax and articulating paper, using stones of the Miller type, having in mind the continuity of the tooth grinding and cutting surfaces, the perfect arrangement resulting does not always stay as we left it, under chewing stress, and must be watched continually.

We are sometimes told that there can be no regeneration or rebuilding of bone or periodontal membrane, but the periodontist knows that it does happen, because he sees it clinically, as in the case of the rabbit cat. Science says this is impossible—just the same it has happened and there are numbers of these animals in existence. It would seem that the actual clinical facts that reveal themselves are the important courts of last resort in our determination of the result of any operation.

From clinical observation covering a number of years, I am obliged to ally myself with those who lay great importance on the influence of the physical condition as a predisponency or as a contributory cause. Perhaps luck played its part, but in numerous cases treated ten years ago where periclasia was arrested when the ophthalmic index, or state of health, was nearly normal, such cases have come down the years doing good service. No doubt correcting the occlusion and keeping it corrected as we attempt to do now in cases of low resistance, would have been a great help in some of our earlier cases which were not as successful as we might have hoped. Yet today, it is my opinion, that no matter what is done along the line of occlusion and local irritations, our work will be doomed to failure, if through systemic disturbances there is a predisposition to destruction of bone above the normal.

As noted before, change from normal in the quality of the blood stream is an important predisposing factor; also auto-intoxication, usually arising from an abnormal condition of the lower bowel or colon, constipation, anemia, the last more frequently in younger patients. Any of these departures from normal lower the defenses of the body, as noted by McCall (3). "Bacteria which produces suppuration can only enter tissue which has been lowered in vitality." Clinical knowledge of the color, texture and gloss of the gum tissue as a barometer in determining the vitality of the patient, has great possibilities, and I would urge that we study the oral cavity tissues closely.

I am not forgetting the influence the serious destruction of bone and pus producing pyorrhea sinuses, as well as apical infection, has on the general health, according to whatever theory we wish to believe, whether "Rosenow's Elective Localization Theory (4), or "Meyer Theory of Opportunity" (5), or "Dukes Anaphylaxis Theory", (6), as summed up by Dr. Joseph Pollia (7). "Each of the above has merit, but none explains all phases per se. Probably systemic expressions of diseased foci are the result of combinations of factors, all of which have not been discovered, so we may take our choice of these theories."

In cases of periclasia when trouble which was entirely local in its origin, has been arrested or eradicated, one should see in a reasonable length of time, sometimes at once, changes to normal or toward normal in the physical condition. But even if there were no contributory physical influences in the inception of this periclasia, the changes from normal in the body, brought about from the local primary foci, might have grown from secondary to the extent that they become a producing cause, and there may have to be something done more than merely to remove the primary local cause.

I have believed for years, that so-called pyorrhea or pus-producing sinuses surrounding the teeth play just as important a part as root end infection, and these foci for the production of low-grade infection, which is carried to certain localities of the body, as a result of whatever theory we may choose to believe, must be given the same attention as root end areas. I think work now being done at Rochester and statements by other authorities such as Pollia, Shamburg, Stillman, Towner and others will bear me out in this assertion.

The most marked proof, of the close relation of the physical to the local condition is in the appearance of the gum tissues in cases which come back for prophylactic care subsequent to pyorrhea or prophylactic treatments, which gives food for thought in regard to the all importance of traumatic occlusion. I do not wish, however, to minimize the serious effects of malocclusion. I recall one case when it was absolutely impossible to keep the patient's gums in a state of health, although we gave due attention to occlusion and every other factor locally. After a number of years spent in trying to do so, the removal of hemorrhoids absolutely changed the local appearance, and simple care now keeps that mouth healthy. Operation for gall bladder infection entirely corrected another case, when no amount of prophylactic measures would keep the mouth in a healthy condition. In auto-intoxication from poor elimination, usually as a result of colon infection, these conditions so common, must be removed or improved, if local results are to be permanent. Severe sensitiveness is often entirely the result of nervous disturbances and said sensitiveness immediately disappears as the patient is brought back to normal.

In many cases presenting for treatment for inflammation of the margin or free gingiva, I have noticed that these conditions were easily corrected when there were no systemic complications,

such as anemia or constipation. If there was a recurrence or the case did not progress as it should, history and examination always revealed these or other systemic disturbances. These facts emphasize the importance of a simple history in all cases.

Let us assume that we have corrected or removed the causes, primary, secondary, predisposing, etc., that brought about abnormal conditions in the surrounding structures, in so far as we were able to do so. Our next task is to guard against recurrence.

We have x-rayed the full mouth, studied carefully the findings, and with them as a guide we have clinically made our examination and obtained our history. The patient has been through the hands of the physical diagnostician and is receiving whatever is necessary in the way of physical correction. We have gone roughly over the occlusion, removed the calcarious deposits above the gums and corrected contact points, replacing fillings where necessary to accomplish this. We have used stimulating measures in the way of brushing, or suction treatments in the way of pre-treatment, a measure in which I strongly believe. We have surgically treated the mouth to the best of our ability and one's judgment must be his guide as to how far he should carry the surgical work in regard to curetting the bone margins and gum resections.

It is my belief that the scraping of the process margins, smoothing the rough surfaces and cleaning the edges of the little germ nests and lateral cysts is of just as much or more importance than cleaning or polishing the teeth.

Lastly we have polished the teeth and the final correction of the occlusion has been accomplished where necessary. The reason that this final work on occlusion is left until surgical work is concluded is because there is often a settling in their sockets of teeth when surrounding structures were inflammed. Removing that inflammation, especially of the perio-dontal membrane, allows the tooth to resume its normal position, making grinding unnecessary. This is not a hard and fast rule, but one's judgment again must be one's guide as to how much should be done on occlusion at the start.

This treatment is concluded by a continuance of the stimulation measures which have followed through from the start as the work has progressed. A form of suction which is allowed to release and draw again about every 2 seconds, or forms of brushing stimulation are a matter of choice.

Naturally the operator should be justly proud of the results that are accomplished often times in these cases; but to hold them, as stated before, is the problem. First, whatever we have in our make-up as students of human nature, must be brought into play to make patients carry out our instructions in the way of home prophylactic measures.

The feminine sex can see the importance of attention given to hair, complexion and nails and they are willing to keep a weekly appointment if need be in their welfare. Sometimes the health arguments have the most weight or it might be that a strong scare as to the loss of all the teeth at a not too distant date will help. There is usually a vulnerable point upon which pressure can be brought to bear. I am sometimes informed that the question of education is an easy matter, but I have to be shown after seeing four or five hundred cases come and go during a period of fifteen years.

Some patients' mouths show wonderful care and they are as regular as clock work in returning for prophylactic treatment, but in some cases, and those perhaps where it is needed most, this is what we have all heard: "Doctor, my mouth felt so good I knew it was not necessary to come in when I received your card."

An interesting fact that I often observe concerning serious cases in the mouths of young men or older men, for

that matter, is that they are aware that the appearance of their teeth is poor and that the breath is offensive and as a result they appear diffident and without poise. Clean up that mouth, polish the teeth, repair what is necessary in the way of dental work, then having talked with him on the improvement in his general appearance, which is very apparent, notice the difference with which that patient presents himself. Usually his health has improved, his complexion is better, his eyes are brighter, he throws his shoulders back and is ready to tackle any job.

I do not think there is a thing in the world pertaining to the personal appearance of a man that will inspire confidence in himself, outside of a good suit of clothes, as much as a clean, healthy set of teeth and nothing seems to diminish his confidence more than the opposite.

In dealing with these cases the periodontist of today must not forget, when he is a little disheartened with some of the delinquents whom he has tried so diligently to educate in the way of regular calls and in systematic home care, that today he is a pioneer in this line of work. One does not need to be a prophet to see that twenty-five years hence these ideas will be the regular system and not the exception, especially with such men as Thomas of Minnesota and other pediodontists at work with the children.

During the last few visits before the patient is discharged, special stress should be laid upon his education by the operator, and dental nurse, or hygienist. If stimulation treatments have been carried on at each visit by the operator or nurse, the patient should now be able to show in front of a mirror, that he can do the operation of brushing properly, as well as the handling of the dental floss, if his periodontist believes in its use.

Why are we so interested in his knowledge of these stimulating measures? We know that gingival tissues depend upon function for life. Nature provides in the mastication of food, especially in handling the coarser types, as they pass over the free gingival and against the septal gingiva, that a very fine type of massage is brought into play. Now, when by reason of the deterioration of bone the septal gingiva has dropped down, and ridges at the margin of the process have formed, of course, the normal manner of massage that nature intended has been destroyed; so to give back to the patient this stimulation that nature intended, we must resort to some artificial means; also, when the trouble is deposits, which cause bleeding etc., with little destruction of bone, that must be remedied so that nature's method of massage can again operate without danger of injuring the marginal tissue.

The time consumed in the operation of brushing and handling the floss should be at least five minutes or more.

First, the mouth is divided into six localities on the buccal and labial of the maxilla. The operator, or dental nurse holding the brush in his own hand and with a sweeping motion downward, from as high up as the mucous fold, brings the brush down ten times over the mucous membrane, septal gingiva and teeth, in the region of the molars. This is accomplished with the brush being slightly turned as it is brought down from the highest point to the cutting edges of the teeth. The same operation is gone through in the region of the bicuspids, also in the locality of canines and laterals and centrals, continuing around the whole upper mouth. On the mandible the same operation on the same six localities is carried out, only that the brush is turned more as it is brought upward, due to the difference in the formation of the mandible.

The lingual operation is the same, except that five localities are used, doing the anterior position on the cuspids, laterals and centrals in one operation of twenty strokes, in place of two localities, as we do on the labial, also brushing the tongue and across the palate.

This is to stimulate all the soft tissues in the mouth and to keep the patient at the brushing operation a longer time.

Next, with a rotary motion, the brush turned at nearly right angle to the teeth, the bristles tipping a little upward on the maxilla and a little downward on the mandible, we go over the buccal and labial surfaces, our attention being paid principally to the free gingiva and septal gingiva, but not attempting especially to force the bristles through the interdental spaces. Lingually, the end of the brush is used with the same rotary motion again, for more massage and stimulation.

We consume half as much time with this as in the first operation of the different localities. We finish the brushing by scrubbing the grinding surfaces and forcing the end bristles of the brush across the distal surface of the second or third molars, as appear in the arch.

As to what brush should be used, the operator and patient must decide that themselves. Sometimes two brushes can be used to an advantage, especially if bridges are to be encountered.

Somewhat different ideas as to technic in brushing are advisable of course, as in cases where the interproximal spaces are very large, but the above is the general plan. The operation of cleaning must be concluded with the use of the wide dental floss charged with a slight polishing abrasive if the proper article can be obtained, or ordinary wide dental floss charged with toothpaste of some kind. We attempt to teach just as definite a technic in the use of the floss as in instrumentation or brushing.

The bottle containing floss is held in the right hand, ten or twelve inches of the floss being drawn out. The loose end is held in the left hand by drawing floss through the hand and around the third and fourth fingers of same hand. Then it is drawn across the end of the thumb or index finger or around the index finger and over the end of the second finger, depending upon what particular place in the mouth one is to use it. With the right hand, containing the bottle, wind floss around index finger until only about one-half or three-fourths of an inch separate the finger of the right hand from finger or thumb of left, depending also on where it is to be used. We are then ready for application in the mouth.

Starting back on left upper and keeping the thumb on inside of cheek we go back of last tooth, then between molars, etc., cleaning and polishing the distal of the mesial tooth and the mesial of the distal, then moving the floss mesially and distally across the interproximal gum tissues, there can be no possible harm done, if contact points are simply left polished so the floss will go through snugly but easily. The main point is to hold the fingers only about the distance apart that the teeth are wide, so that it is impossible to strike down on gums. Under bridges a short curved bodkin through the eye of which the floss is threaded, is used.

This method has given us gratifying results. The patient is taught the correct technic and then given floss to take home, bringing same at next visit for correction of any errors that might have occurred in his use of same at home. We advise the patient to stand in front of a glass to be able to see what he is doing both in brushing and in the use of the floss.

We do not wish to burden you with too many ideas of stimulation but another method which has given good results especially in cases of low vitality is as follows:

Massage produced by placing the tip of the forefinger interproximally at the gum margins and allowing the finger at point of contact to move slightly, but rotating the hand through a much larger arc, all around the mouth, inside and out, is a fine home massage for bone and tissue building.

Where we are using methods of brushing or wide dental floss as a preventive the object is to keep the septal tissues, septal fibers and connective tissue set-

tling as the bone disintegrates between the teeth, as it does even in mouths that we would say, at a casual glance, were normal, but about which the x-ray tells us a different tale. Interproximal tissues becoming loose, soon there is a chance for ingress of bacteria and our trouble begins. As a matter of experience it will be noted that as the years go by, under this treatment there appears to be more space and the tissues are settling somewhat, but if the teeth are clean and free from deposit, the tissues should be healthy. Combining this with correct occlusion and all the stimulations at our command, it must stop as much as possible the disintegration of bone, and would seem to be the highest type of prevention.

Gentle wood-sticking against the gums with or without a medicament is a regular procedure.

At every return visit for prophylaxis, the patient receives a suction treatment and besides that, all the teeth are carefully gone over and around with files which are more like burnishers, to discover whether there is any roughness or slight deposit.

As this operation continues the gum margins are carefully inspected to find any little inflammation which may have been caused by small deposits or slight roughening of fillings, and the gums are treated with whatever medicament the case seems to require, or with nothing at all. Sometimes we use escharotics or stimulants which we must admit we are not yet ready to discard entirely, especially in cases where the patient's vitality is below par.

When patients have not been through the hands of the physical diagnostician as in mild prophylactic cases, etc., we can do a wonderful service along the lines of prevention by giving them a few simple ideas in regard to diet. For instance, how many people drink the necessary amount of liquid every day, which roughly speaking amounts to around six to eight glasses? That question put to most of our patients elicits the answer that half that amount had not been used. Then, we know most people eat too largely of protein diet, meats, etc., and not enough nitrogen and lime producing foods. Coarse breads should be advised; also the use of fruits, especially oranges and apples after meals, should be suggested. Sometimes the patients will heed this advice.

If we believe authorities on diets, these suggestions are of great importance. I quote Dr. Kellogg (8) of Battle Creek Sanitarium, who, said: "Dental decay and mouth infection are the result of lowered resistance; a low protein diet combats intestinal toxemia and thus raises the vital resistance; dry foods are necessary to stimulate the normal flow of saliva; importance of regular and free use of uncooked foods which supply the body with vitamins."

In closing, the only conclusion I have to offer is this: Knowing the relation the teeth have to our bodily ills, if the operations outlined above in brushing, and the use of wide dental floss or other methods along these lines, are employed as a preventive measure early enough to insure a healthy mouth to start with; and if these methods are religiously lived up to, providing of course that the physical vitality remains at par and occlusion is kept as near normal as possible, the periodontist's work would be confined almost entirely to preventive and prophylactic operations. I leave you to judge of what vital importance that would be to humanity.

Bibliography

1. Talbot, Eugene S. *Dental Cosmos*, August, (1921), p. 795.

2. Dewey, Martin. "Practical Orthodontia," (1919).

3. McCall, John Oppie. *Dental Cosmos*, January, (1922), p. 46.

4. "Rosenow's Elective Localization Theory." *Jour. of Dental Research*, September, (1919).

5. "Meyer Theory of Opportunity." U. C. Research Department.

6. "Dukes Anaphylaxis Theory." Oral Sepsis in its Relation to Systemic Disease.

7. POLLIA, JOSEPH. (Post Graduate course given by Dr. Joseph A. Pollia during 1920).

8. KELLOGG. *Dental Summary,* August, September and October, (1915).

DISCUSSION

Frederick A. Bricker, Rochester, Minnesota: In patients who present extreme absorption of the alveolus and bring from the internist a history of diabetes, nephritis, anemia, high blood pressure, and constipation, I am careful to retain only those teeth for which the prognosis is especially good, since in such patients, especially in diabetics, the resistance and recuperative powers are greatly diminished.

Malocclusion is one of the most important factors in periclasia, especially in the permanency of its cure. I consider lack of care the first etiologic factor, and malocclusion the second; in patients past thirty-five years of age, malocclusion takes first place. I wish to emphasize Dr. Weaver's remarks on the importance of detecting and correcting malocclusion.

The question of non-vital teeth has caused so much discussion with so little definite conclusion, that I will leave it to the common sense and good judgment of the dentist and patient. However, I have found non-vital teeth as responsive to treatment as those whose pulps are vital.

Dr. Weaver suggests revitalizing the tissue before proceeding with instrumentation. Personally, I believe in removing the irritant, wherever it may be found, as soon as possible. The tissues will then revitalize themselves better if circulation is stimulated with the brush after the irritant has been removed.

Dr. Weaver suggests tissue resection as the last resort. If eventually, why not in the beginning? In patients with pockets 6 mm. or more in depth it has been my experience that resection and curettement of the process are indicated and assure a more permanent result.

For postoperative care the patient should return in the course of a month, in order to ascertain whether the instructions are being followed.

Granting the operative procedure has been properly performed, the care by the patient at home is undoubtedly most essential. Back of the home care by the patient lies the education of that patient, and here is the point at which so many of us have failed. The success of preventive measures depends on the teaching, and this in turn depends on the teacher. The more extensive the knowledge of the teacher, the more ably can he teach. The major portion of the profession is not prepared in its subject; therefore, the teaching is not convincing and does not encourage co-operation.

Psychologically, it is necessary first to attract attention, which will arouse interest, which creates desire, and terminates in action.

W. R. Hughes, Oakland, California: I believe more attention should be paid to the toothbrush and along with Dr. Weaver's thought, I believe the toothbrush should be constructed on a scientific principle. I find in the office that we need two brushes, one for the labial and lingual surfaces of the tooth, and a shorter brush for the lingual surfaces of the six lower front teeth. This same brush being used very effectively on the distal surfaces of the last teeth, both upper and lower.

The subject has been left too much at random. Even our fellow dentists are not good teachers. They have omitted to teach the patient how to use his brush. In the first place, we as dentists should be taught how to use the brush for how can we expect to teach others if we ourselves do not know?

H. Everton Hosley, Springfield, Massachusetts: For a number of years I have found many of my patients were giving conscientious brushing to their teeth, but were returning with mouths in an uncleanly condition. It took some little time and the making of considerable data to find out why the teeth were not clean when I knew my instructions were being carried out. The final solving of that problem was brought about by asking them to bring in the toothbrushes that they were using. That was followed by the query, "how long have you been using this toothbrush?" I think the minimum time was some four months and up to two years. Now, I have a very good collection of those toothbrushes, and they tell a very interesting story. It showed that the bristles were not worn out, they were softened out, and they were not doing the work required by them. This matter was very easily cleared up by the prescribing of a new toothbrush at least once in thirty days or not longer than sixty days; and I have found a great source of satisfaction to the patient and to myself in prescribing a new toothbrush every thirty days. Many of my patients have expressed their grateful appreciation for this simple little recommendation.

W. B. Lee, Eugene, Oregon: I would like to ask concerning the sterilization of the toothbrush. It has occurred to me that groups of dentists could co-operate and by motion pictures or other ways as vivid-visualize to

the public just how to save their teeth, and thus be reaching that great majority who are still in ignorance.

Why not broadcast such essentials in a practical way?

Dr. Weaver (Closing): Dr. Bricker and I have discussed these several points a number of times. The first point, our revitalization measures, have been used for this reason: We found, after a case of advanced periclasia had received stimulating treatment, such as suction massage or brushing, that immediately upon starting our instrumentation, the response to the surgical treatment was much more marked than when we commenced the instrumentation without this pre-treatment.

Of course, before these treatments are started, the teeth are casually cleaned, that is, the deposits above the free margins are removed and the surfaces given a cursory brushing.

We have noticed with interest, that mouths subjected to stimulation massage treatments, followed by medication, appeared nearly normal after a few weeks, and this condition was the result of no serious instrumentation at all. Of course, this apparent result would not be permanent, but to our minds, showed the value of pre-treatment or revitalization. Bear in mind that in the above, we are speaking of advanced periclasia, where there has been considerable destruction of bone.

In regard to gum resection, experience has taught us that too much in that line can be done at first. Cases where it seemed advisable at the start, especially anteriorly, which were allowed to stand under other treatments for a time, came through in such condition that resection was found unnecessary. Posteriorally, where there is extensive destruction of bone and loose flabby tissue, it is indicated.

Answering Dr. Hughes' question regarding instructions to the patient in brushing, etc., this question of the care of the teeth at home by the patient, seems to me, one of the most vital problems that the dentist has to deal with. In the first place, the dentist has to know something about what he expects to teach, next he has to have the ability to instill into the patient, the importance of these prophylactic measures and be able to demonstrate to them, how it should be done. Lastly, he must be a good pedagogue and must be willing to devote to preventive dentistry enough time for its successful accomplishment.

Teaching a method of brushing, or the use of dental floss, cannot be done in five minutes, and it sometimes takes repeated lessons before the patient becomes proficient in this use.

Our method is to give a thorough lesson on the use of the brush and wide dental floss, then let them experiment at home and on their return for their appointments, continue the instructions, letting them show you before the mirror, that they understand what we have endeavored to teach them, and that they are able to do the several operations to our satisfaction.

The reason why a great many dentists do not spend more time than they do along this line is, because of the feeling that they are not getting paid for this time, in other words, that it is wasted. There is no easier way for the dentist to make money. He must acquire the ability to be able to make the patient understand the value of prophylactic services, and he must also have the ability to perform that service and then see that he is paid for it just the same as he is for his other dental operations.

Concerning diets, one has only to recall what is heard upon the floor of the convention, to realize the importance of this subject. In cases of advanced periodontia, we believe in a complete medical diagnosis, the diet question being up to the diagnostician.

The periodontist should have a good general knowledge along the lines of diets, and in all prophylactic cases this subject should be seriously discussed with the patient, as for instance, the amounts of liquid taken and the danger of a too high protein diet, etc. It is of vital importance.

Coming to different methods of brushing, there are a number of ways to use the brush, which under the instruction of different men appear to accomplish the desired result, but the method used must be the one that in your hands gives the desired results.

The dental tape we use is a wide dental floss, designated by some firms as Nos. 1, 2, 3, etc., in width or by others as A, B, C. The width used depends upon how close the teeth are, the wider the floss the better, when the teeth are not too crowded. Some men do not advocate the use of floss. I have no argument to offer against their not using floss, if they get the results they wish without it. I do know that we get what we want with its use combined with brushing, and that without it in a good many cases, we could not get what we wanted.

Dr. Hosley asked about sterilizing the toothbrush; this may be sterilized in alcohol or any other antiseptic solution if desired, or a good idea is to scrub the brush every few days using a small brush, soap and water and then dip into alcohol, shake dry and hang up.

FOCAL INFECTION AS A CAUSE OF DISEASES OF THE URINARY TRACT[1]

By JOHN G. MEISSER, D.D.S., Rochester, Minnesota

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)

CERTAIN chronic progressive diseases of the urinary tract, such as nephritis and cystitis, have often shown little improvement under medical treatment. In many cases the surgical removal of the ulcer-bearing area in submucous ulcer of the bladder or the removal of calculi in nephrolithiasis has not prevented recurrence of the disease. This suggests that treatment has often been directed against the outcome of the disease rather than the cause.

Nephritis, pyelonephritis, and cystitis have generally been regarded as the result of colon bacillus infection, because this organism is almost constantly present in the urine of patients so affected. In a very careful study of a series of patients with such diseases, many of whom were only temporarily benefited by medical treatment, Bumpus (1) and I (2) found that the disease was generally due to streptococci harbored by foci of infection and that the colon bacillus was merely a secondary invader. Following the removal of foci of infection, many patients showed marked improvement. I shall report in detail a typical case of pyelonephritis because it emphasizes the importance of a careful search for foci of infection, and shows what a serious operation the removal of infected teeth may be in cases of nephritis. The case also demonstrates our method of study in such patients.

[1]Work done in the Division of Experimental Bacteriology, Mayo Foundation.

Report of Case

Case 1 (A344376), Mrs. M. H., aged forty-five years, was examined December 23, 1920. She complained of slight soreness around the crest of the right ilium and burning pain at the end of urination. Several cystoscopic examinations failed to reveal any pathologic condition in the bladder. Urine obtained from the kidneys showed large amounts of pus and a few erythrocytes. No tuberculosis bacilli were present in the urine, but colon bacilli were found in great numbers. A roentgenogram of the urinary tract was negative. An examination of the mouth which included roentgenograms of the jaws revealed five devitalized teeth, four of which showed evidence of periapical infection. Two of the patient's vital teeth had caries of sufficient depth to expose the pulp. Restoration of these teeth without devitalization was impossible. An examination of the throat revealed infected tonsils. The patient's examination was otherwise negative. A diagnosis of pyelonephritis was made and she was advised to have the infected teeth and tonsils removed.

Three rabbits were injected with a pure culture of colon bacilli recovered from the patient's urine prior to the extraction of the teeth. None showed evidence of lesions. Two teeth with evidence of infection were removed and cultured. No reaction followed. Both cultures yielded green-producing streptococci and a few staphylococci. These

cultures were injected into three healthy rabbits, all of which developed lesions in the kidneys; one also developed multiple minute hemorrhages in the right ureter near the pelvis of the kidney. (Catheterized specimens of urine from all rabbits used in this study were normal before injection.) Streptococci were recovered in pure culture from the lesions in the kidneys of these rabbits.

Six days later three other teeth were removed including the devitalized tooth which was apparently negative in the roentgenogram. All three yielded pure cultures of green-producing streptococci. Three rabbits were injected intravenously with these cultures. Two developed lesions in the kidneys. One of these had been injected with a culture obtained from the devitalized tooth that was apparently negative in the roentgenogram. The day following the removal of these teeth the patient had a severe chill, followed by a temperature of 106. A culture made from her blood during this reaction yielded streptococci in pure culture; this, injected intravenously into two rabbits, produced lesions of the kidneys in both. From these lesions the streptococci were again recovered, while cultures from liver, spleen, blood and bile, were negative.

Because the patient's reaction following the extraction of teeth was so acute, doubt was expressed as to its renal origin. It was suggested that the reaction might be due to respiratory infection, although the patient had no pulmonary symptoms. To clear this point, cultures were injected directly into the trachea of five guinea pigs according to the method devised by Rosenow. None of these developed pulmonary symptoms but one developed marked lesions in the kidney and ureter. A few days later cultures made from catheterized specimens of the patient's urine showed streptococci and colon bacilli, although the colon bacilli were the predominating organisms. Five rabbits were injected with these cultures and three developed lesions in the kidney. Streptococci and colon bacilli were recovered from the lesions in the kidneys of two of the rabbits; these two and one other rabbit developed lesions in the intestines.

Eighteen days after the second extraction, the two vital but carious teeth previously mentioned were removed. The pulp of both yielded pure cultures of streptococci which were injected into four rabbits. Two developed lesions in the kidneys, one, lesions in joints, and the other a few lesions in muscles.

During the intervals between the extraction of teeth many catheterized specimen of the patient's urine were cultured. Colon bacilli only were found in all cultures, except in those made following the patient's reaction after the second extraction.

In order to determine the relative ability of colon bacilli and streptococci to grow in urine, three specimen of the patient's urine were autoclaved. Some of the tubes of sterilized urine were inoculated with colon bacilli, from the patient's urine, some were inoculated with streptococci isolated from the patient's teeth, and some with both organisms. It was found that the colon bacilli multiplied rapidly on only a few hours' incubation, while the tubes inoculated with streptococci required several days' incubation, and then relatively few organisms could be found. Tubes inoculated with both organisms showed only the colon bacilli after incubation. This probably explains the frequent absence of the etiologic organism in the urine of patients with pyelonephritis.

The patient remained under our care for one month after the extraction of her last infected teeth. During this time six catheterized specimens of urine were obtained and cultured at various intervals. Each successive examination revealed fewer colon bacilli. On the sixth examination cultures of the urine from the left kidney were negative, while cultures from the right kidney contained only

fifteen colonies of colon bacilli. No pus was present in either kidney.

A specimen of the patient's urine sent to us one month after her dismissal showed but three pus cells to the microscopic field. Her physician said that she was free from symptoms and was planning to have her tonsils removed.

Experiments

Rosenow and I have recently reported a case of chronic nephritis in which the disease was produced in dogs following

Fig. 1.—Rubber dam applied to upper and lower jaws of a dog under ether anesthesia by the intratracheal method. Cuspids to be devitalized are cut off midway between incisal edge and gum margin.

the devitalization and infection of teeth with bacteria isolated from patients' foci (6). The results obtained in animals injected intravenously with bacteria isolated from the infected teeth of patients with pyelonephritis and submucous ulcer of the bladder and those obtained in dogs following the experimental production of chronic foci, suggested that certain chronic diseases of the urinary tract, not generally believed to be due to infection, might be produced in animals if a continuous supply of bacteria could be furnished through a focus of infection. With this idea in mind, a series of seven patients was selected for study, five of whom had nephrolithiasis, and two, alkaline phosphatic cystitis.

The dogs used in the experiments were healthy, well-nourished animals. Catheterized specimen of urine were obtained prior to the devitalization and infection of teeth were normal. Preliminary roentgenograms of the region of the kidney did not show evidence of calculi. In all of the dogs the permanent teeth were present and in a healthy condition. The dogs were kept under ether anesthesia by the intratracheal method. The animal was placed on an operating table and covered with a sterile sheet and towels. Rubberdams were then applied to the upper and lower jaws isolating the teeth to be infected. The isolated teeth and rubberdam were carefully scrubbed with a tincture of iodin and alcohol. The intratracheal tube and other portions of the mouth were carefully walled off with sterile gauze (Fig. 1). The teeth were cut off midway between the incisal edge and the gum margin with sterile bone nippers. The pulps were carefully removed with broaches which were sterilized in the flame just before using, and after the hemorrhage ceased the bacteria in dense suspension were introduced into the pulp chamber by means of capillary pipettes. The canals were then sealed with cement and amalgam. These animals and the control animals used in the same experiments were kept under hygienic conditions and fed on a balanced ration of dog biscuit and meat.

In three of the five experiments on nephrolithiasis the bacteria used to infect the teeth of the dogs were isolated from the patient's infected teeth. In one experiment they were isolated from teeth and tonsils of the patient, and in one from the patient's urine and from an infected tooth. The organism used to infect the teeth of dogs in these experiments was a streptococcus. In the three cases in which the infecting organisms

were obtained from patient's teeth, and in one case in which they were obtained from teeth and tonsils. Calculi were found in the kidneys of nearly all animals several months after devitalization and infection of teeth.[2]

In the last case the four cuspids in each of ten dogs were infected with streptococci isolated repeatedly from the urine of a patient after typical attacks of renal colic due to stones. In two dogs the cuspids were infected with streptococci from the only remaining in-

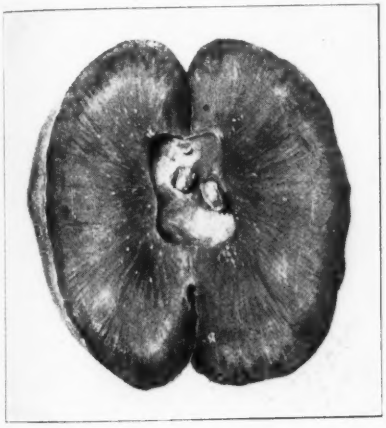

Fig. 2.—Urinary calculi in pelvis of dog's kidney three months and twenty-seven days following the devitalization and infection of teeth with streptococci.

fected tooth in the patient's mouth. The patient had all other infected teeth removed shortly before our experiments were begun. Sixteen dogs were used as controls; in twelve, the cuspids were infected with streptococci from other sources than patients with nephrolithiasis and in four the teeth were not infected. The duration of this experiment ranged from eleven to one hundred and twenty-three days. Eight of the ten dogs infected with streptococci isolated from the patient's urine developed calculi; one of

Fig. 3.—Roentgenogram of kidney region at time of devitalization and infection of teeth. No evidence of calculi.

the two negative dogs died of distemper eleven days after the infection of his teeth, too soon for stones to form. Both

Fig. 4.—Roentgenogram of kidney region three months and twenty-seven days after infection of teeth showing evidence of calculi embedded in pelvis of kidney shown in Figure 2.

[2]A detailed discussion of these and other cases of nephrolithiasis will be published in the Archives of Internal Medicine in collaboration with E. C. Rosenow.

dogs infected with streptococci from the patient's tooth developed calculi. None of the sixteen control dogs developed urinary calculi. The calculi varied in size from small concretions to stones measuring 3 by 7 mm. (Fig. 2). The stones resembled those found in man and were of the same chemical composition as those removed from the patient. The larger stones were visible in roentgenograms taken at necropsy while roentgenograms of the

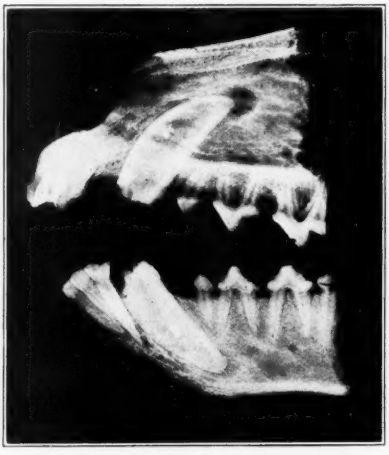

Fig. 5.—Roentgenogram of dog's jaws showing rarefied areas in bony process around upper and lower cuspids three months after devitalization and infection of teeth.

region of the kidney were negative at the time the teeth were devitalized (Figs. 3 and 4). The streptococcus was recovered from the kidneys, from some of the stones, and from the devitalized teeth, although many of the infections around the teeth also showed secondary invasion of bacilli. The elective affinity of the streptococci isolated from these sources (kidneys, stones, and granulomas at apices of the devitalized teeth) for the medulla of the kidney was demonstrated by the intravenous injection of many rabbits.

Sections of the dogs' kidneys stained by the Gram-Weigert method revealed diplococci in the collecting tubes where crystallization and stone formation were beginning. Roentgenograms of the dogs' jaws taken at necropsy showed large rarefied areas around the apices of the devitalized teeth (Fig. 5).

Although the teeth were somewhat discolored they were firmly embedded in the alveolar process. There was no evidence of swelling at the apices of the

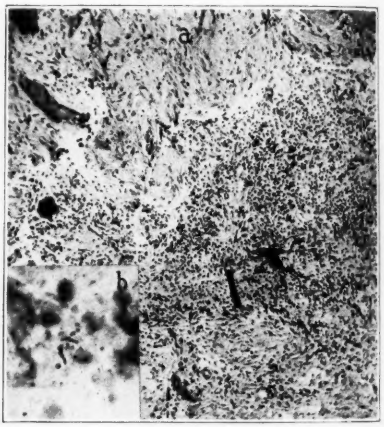

Fig. 6.—(a), Section from granuloma of dog's tooth showing area of round-cell infiltration. Hematoxylin and eosin (x 40). (b), Short-chained streptococci within area of round-cell infiltration. Gram-Weigert (x 1000).

teeth. Microscopically, the granulomas showed marked proliferation of the fixed tissue elements with infiltration of round cells (Fig 6a). Embedded within some of the granulomas were small particles of bony tissue. Sections stained by the Gram-Weigert method revealed short-chained streptococci and diplococci within areas of round-cell infiltration (Fig. 6b). In many sections the capillaries in the bony process immediately surrounding the granulomas were filled with short-chained streptococci and diplococci (Fig. 7, a and b).

The experiments with cultures from the infected teeth of one of the two patients with alkaline phosphatic cystitis were performed by the intravenous injection of rabbits, and with cultures from the other by the inoculation of teeth in dogs and the intravenous injection of rabbits.

Report of Case

Case 2 (A342620), Mrs. L. M., aged forty-nine years, came to us April 20, 1921. A diagnosis of alkaline phosphatic cystitis was made. Physical examination was negative, except for the findings in the urinary bladder. Dental examination revealed evidence of periapical infection in twelve teeth. These were extracted at various intervals. Six of the extracted teeth were cultured; three yielded green-producing streptococci in pure culture and three, green-producing streptococci and a few staphylococci.

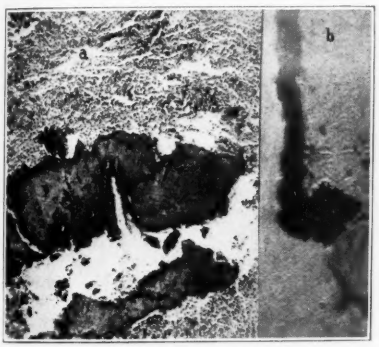

Fig 7.—(a), Section from granuloma of lower cuspid shown in Figure 5. Note areas of round-cell infiltration and bony process. Hematoxylin and eosin (x 50). (b), Capillaries within bony process filled with streptococci and diplococci. Gram-Weigert (x 500).

The primary cultures were injected intravenously into seven rabbits and all developed lesions in the urinary tract. Six of the seven developed lesions in the urinary bladder, and two of these also developed lesions in the medulla of the kidneys. The seventh rabbit developed lesions in the medulla of the kidney only. The bladders of these animals showed marked edema, and scattered throughout the wall of the bladder were many hemorrhagic lesions. In some rabbits they occurred as small punctate areas, while in others they were very pronounced and invaded the submucous tissue as well as the mucous membrane. In one rabbit the findings were especially interesting.

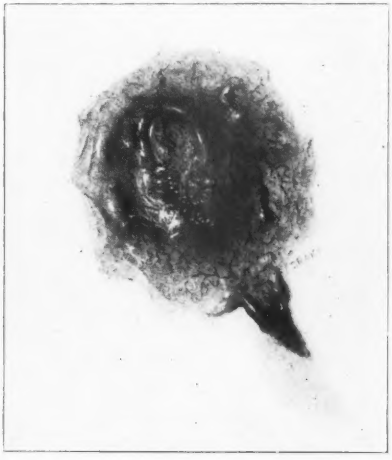

Fig. 8.—Urinary bladder showing calculi adherent to inflamed and edematous mucous membrane.

The walls of the bladder in this animal were markedly edematous, especially in the anterior and lateral portions. In the center of this area was found a round, rough, yellowish white concretion about 2 mm. in diameter. This calculus was adherent to the mucous membrane. Extending in a direct line from it toward the neck of the bladder (a distance of 2 cm.) was a markedly inflamed area, more deeply red than the surrounding tissue. In this area which was 3 to 4 mm. wide were found eighteen minute calculi, similar in appearance to the larger one described (Fig. 8). The cal-

culi were all adherent to the mucous membrane and surrounded by a turbid exudate. Scattered throughout the wall of the bladder were many fading hemorrhagic lesions involving the submucous tissue as well as the mucous membrane. These varied in size from small punctate hemorrhages to hemorrhages 2 and 3 mm. in diameter. There was no evidence of gross lesions in any other organ. The urine contained magnesium phosphate and calcium phosphate crystals; it yielded green-producing streptococci in pure culture.

Microscopic examination showed a loss of epithelium in the ulcerated area in which the calculi were embedded; the changes were most extensive in the submucosa where there were large areas of round-cell infiltration. The muscular coat was only slightly affected. Sections stained by the Gram-Weigert method contained diplococci within areas of round-cell infiltration (Fig. 9, a and b). Three rabbits were injected intravenously with the green-producing streptococci isolated from the urine of this rabbit. Lesions developed in the kidneys in all three.

All of the ten rabbits injected with cultures from the teeth of this patient developed lesions in the urinary tract. Six of the seven injected with primary cultures from the teeth developed lesions in the urinary bladder. Only three of the ten developed lesions outside the genito-urinary tract; one had a few very small lesions in the anterior tibial muscles, one, slight joint involvement, and the other, a hemorrhagic lesion in the pyloric end of the stomach. These, however, were relatively slight.

Cultures made from the patient's gums showed the green-producing streptococcus to be the predominating organism. These cultures, even though injected intravenously into rabbits in large doses, failed to produce lesions.

The cultures obtained from the infected teeth of the second patient with alkaline phosphatic cystitis were inoculated into the four cuspids of three dogs and injected intravenously into four rabbits. In each dog one lower incisor was devitalized in a sterile manner, the root-canal filled with guttapercha, and the cavity sealed with amalgam. Although the four injected intravenously developed lesions in the urinary tract, none developed calculi or phosphatic deposits.

Fig. 9.—(a), Section of urinary bladder showing loss of epithelium and areas of round-cell infiltration where calculus had been removed. Hematoxylin and eosin (x 50). (b), Diplococcus within area of round-cell infiltration. Gram-Weigert (x 1000).

In two of three dogs infected with these cultures by devitalization and infection of teeth, urinary calculi were found four months after devitalization and infection of teeth. However, all dogs developed lesions in the urinary tract, one, in the urinary bladder only, another, in the urinary bladder and kidneys, and the third, in the kidneys only. Granulomas developed at the apices of all devitalized teeth, including those devitalized and filled in a sterile manner.

The elective affinity of the strepto-

coccus recovered from lesions in the urinary tract and the infected teeth of the dogs for the urinary bladder and kidneys of rabbits, was demonstrated by intravenous injection.

Discussion

That a relationship often exists between foci of infection and certain progressive diseases of the urinary tract is demonstrated by the results in these experiments. The reaction obtained in the case of pyelonephritis following the extraction of infected teeth emphasizes the danger of removing too many teeth at one operation, or of not allowing enough time to elapse between operations, especially if there is a probable relationship between the systemic disease and the foci of infection. The importance of carefully removing all infected teeth is emphasized. The experiments on dogs show that the injection of overwhelming numbers of bacteria is not necessary to produce disease experimentally, but that even better results are obtained in some cases following the production of chronic foci with relatively few bacteria. The chronic foci produced experimentally were similar to those found in patients. The teeth were somewhat discolored but did not seem to cause pain. They remained firmly embedded in the alveolar process and developed granulomas, the histopathology of which was similar to granulomas found at the apices of infected teeth in man.

That teeth devitalized in a sterile manner may become secondarily infected through the blood stream is demonstrated by the results obtained in the second case of alkaline phosphatic cystitis. In each dog in this case cultures from the one tooth devitalized and filled in a sterile manner yielded the same organism as did the teeth infected at operation. In the experiment on alkaline phosphatic cystitis the disease was reproduced in animals following the injection of streptococci isolated from the patient's infected teeth, while negative results were obtained in animals following the injection of streptococci isolated from the mucous membrane of the mouth. This further demonstrates what Rosenow has emphasized, that because of varying grades of oxygen pressure, streptococci within a focus of infection change their virulence and other properties and acquire an elective affinity for certain tissue and organs, while streptococci growing under aerobic conditions do not acquire these properties (3) and (4). In similar experiments animals injected with streptococci from the mucous membrane of patients' mouths failed to produce lesions, while those injected with streptococci from the infected teeth developed, in many instances, lesions corresponding to those in the patients.

The results in animals following the production of chronic foci should remove all objections to the acceptance of the theory that infections in and around teeth are often the cause of certain systemic diseases.

Bibliography

1. Bumpus, H. C. and Meisser, J. G. "Foci of Infection in Cases of Pyelo-Nephritis." *Journal American Medical Association*, Vol. LXXVII (1921), p. 1475-1478.

2. Meisser, J. G. and Bumpus, H. C. "Focal Infections in Relation to Submucous Ulcer of the Bladder and to Cystitis," *Journal Urology*, Vol. VI (1921), p. 285-298.

3. Rosenow, E. C. "Elective Localization of Streptococci." *Journal American Medical Association*, Vol. LXV (1915), p. 1687-1691.

4. Rosenow, E. C. and Ashby, W. "Focal Infection and Elective Localization in the Etiology of Myositis. *Archives of Surgery*, Vol. XXVIII (1921), p. 274-311.

5. Rosenow, E. C. and Meisser, J. G. "Nephritis and Urinary Calculi after Production of Chronic Foci of Infection. *Journal American Medical Association*, Vol. LXXVIII, (1922), p. 266-267.

6. Rosenow, E. C. and Meisser, J. G. "Elective Localization of Bacteria Following Various Methods of Inoculation and the Production of Nephritis by Devitalization and Infection of Teeth in Dogs." *Journal Laboratory and Clinical Medicine*. Vol. VII (1922), p. 702-722.

Discussion

W. F. Whalen, Peoria, Illinois: I would like to emphasize, Dr. Meisser's point about the extraction of teeth. Clyde Davis of Nebraska some time ago recommended the serial extraction of teeth, that is, a few at a sitting. I was very much impressed with that, because I have had reactions, from extracting large numbers of infected teeth at one time. The patients were extremely ill afterwards.

I will cite a case of a traveling man who had developed kidney trouble, and had lost forty-five pounds of flesh in approximately seven months. I asked him, "Has your physician mentioned that there could be a possible connection between your kidney trouble and your teeth?" "Oh, no, never." I said, "You had better suggest it to him." He did so, and the physician called me up in about half an hour and wanted to know what I meant by mentioning the possible connection of infection of the teeth with the kidney trouble. I told him it was merely to help the patient if I could and that I would be very glad to co-operate with him. X-rays showed teeth such as has been shown here, with marked rarefaction at the apices of seven of them. I extracted two of them and obtained no reaction whatever. I waited eight days and extracted two more without any reaction. Then I waited eight days more and extracted three teeth, and in about thirty-six hours after the extraction of the three teeth, which made seven altogether, I had a consultation of physicians, and the man very nearly died. They pulled him through, and put him on his feet, with the result that he has made a complete recovery, and has regained all his flesh, and is apparently perfectly well.

We usually will get the reaction from the extraction of even one tooth that is badly abscessed, but this was a case where it took the third extraction before we got it. And I would like to have Dr. Meisser explain why it was. Was it the bodily resistance? Why was it that it took the third extraction before we broke down the resistance of the patient? I am heartily in favor of the serial extraction of teeth. I think we should be very cautious in taking out large numbers of infected teeth at one time.

Dr. Meisser (Closing): We did not implant teeth in any of the animals. We removed the pulps from certain teeth and infected the pulp chambers with streptococci isolated from the patient's foci. The removed pulps were cultured and found sterile. In one experiment, one tooth in each dog was devitalized and filled in a sterile manner while several were devitalized and infected. Those devitalized and filled in a sterile manner became secondarily infected. Whether or not certain methods of treating infected teeth, and of filling root-canals would prevent secondary infection, I cannot say. That is a problem we are working on at the present time.

We have not been able to isolate bacteria from the pulps of healthy teeth. If considerable pyorrhea is present about the root, or if the tooth has a deep cavity, the pulp is often infected. Our results in such cases have been similar to those obtained by Collins and Lyne and Henrici and Hartzell.

In most instances the cultures were obtained from non-vital teeth. However, in the first case cited, several rabbits were injected with streptococci isolated from the pulps of two vital teeth, both of which had cavities so deep that to place restoration in them would have necessitated devitalization. We have not been able to isolate bacteria from pulps of healthy teeth.

The severe reaction in the patient with pyelonephritis followed the second extraction of teeth. At the first operation two infected teeth were removed without difficulty but at second operation, the root of one tooth broke off at the apical third. This was removed with an elevator and in doing so the tooth socket was subjected to considerable trauma and curettement.

I think the reaction you get depends to a certain degree on the amount of curettement you do. When removing an infected tooth it is advisable to remove the granuloma, if one is present, with as little curettement as possible. The careful removal of several infected teeth often causes less reaction in the patient than the removal of one infected tooth followed by too much curettement.

That injection of overwhelming numbers of bacteria is not necessary experimentally to produce disease in animals is demonstrated by the results of these experiments Through the production of chronic foci in dogs we have experimentally produced a disease not commonly thought to be due to infection. The chronic foci produced in animals were similar in every respect to those found in the mouths of many patients. These results I believe demonstrate the importance of removing all dental foci in patients with certain diseases of the urinary tract, such as pyelomyelitis, nephrolithiasis, alkaline phosphates, cystitis, and so forth.

SYSTEMATIZED CAST GOLD INLAY TECHNIC

By O. S. CLAPPISON, D.D.S., Hamilton, Ontario, Canada

(Read before the Chicago Dental Society, October 17, 1922)

Past History of the Cast Gold Inlay

THE past history of the cast gold inlay has been as fanciful as the many colors of Joseph's coat. The technics have numbered legion, and the appliances have shown a variation from a pea-shooter to a cowbell. The bewildered operator has been deluged with the advice from one, to cast them hot; from another to cast them cold; to spin them fast; and to spin them slowly. His fancies have run riot, his opinions have been given full rein, they very often being merely opinions and not based on fact.

The late Alexander Graham Bell, during his lifetime, kept before his mind's eye, as a motto, these three words: *Observe, Compare, Record,* and his life's work bears testimony to his faithfulness to his motto. It is only by observing the various steps in each method of casting in use, recording the findings and comparing the results obtained, that ultimately we will come to any unanimous conclusion, improve our technic and arrive at the haven of our desires; namely, a recognition of the most acceptable method of casting and the universal adoption and standardization of same.

After fifteen years or more, of development and progress in the art and science of casting, our technics have been somewhat simplified and our problems have been greatly reduced, but there are still many obstacles to be overcome and many facts to be uncovered before the profession will accept as a standard any technic that has been advanced up to the present time.

I do not come to you with any dogma, creed, or hobby, but with an open mind, even as Diogenes with his lamp, looking for a few honest souls, and laying aside all bias and prejudice, will earnestly seek for a rose here, a lily there, ultimately composing a garland fit for any brow and disdained by none. It is not possible, to get together on this problem with minds unclouded by pre-conceived ideas and convictions, and with an eye single to the advancement of our profession, for whatever technic one may favor, let us not forget that in the last analysis, "our agreements are greater than our differences." Let us give all honor where honor is due, to the father of the casting process, Dr. Taggart, and others who, by following Dr. Bell's motto, have given us much valuable data as a result of their unceasing toil.

What is a Perfect Inlay?

Dr. Ottolengui says, "A perfect inlay must be an exact metal replica of a perfectly adapted, carved, contoured, polished, and scientifically manipulated wax pattern when such pattern is in the cavity in the mouth."

A perfect inlay is not our ideal of what an inlay ought to be. Idealism is a beautiful theme in every walk of life, but idealism in the science and art of dental castings is a harbor never reached, a pinnacle never scaled and if we would approach the summit, it must only be by steps of careful discrimination, painstaking analysis, choosing only what is best and holding fast to that which is good, and while there must of necessity be inherent defects in any operative procedure which cannot be overcome; these defects may be due to materials, methods, or the limits of human accomplishment, but when we have eliminated every possible defect, we will have a perfect result.

Present-day Technic

It requires no great exercise of one's imagination to observe how far short of the ideal we have come in the past. Nor is any process of elimination needful to arrive at the most commonly used technics continued into the present. For comparison, we will divide these into four classes.

(1) High Heat Technic—Heating to 500 degrees F. and over. Almost or entirely eliminating wax carbon residue, producing in the mold; dark brown residue at 500° F.; light brown residue at 600 to 650° F.; white (eliminated) at 700° F.

(2) Low Heat Technic—Heat not to exceed 320 to 400° F.; the wax is absorbed into the investment and carbonized to desired degree of carbonization.

(3) Low Heat Technic—Eliminating wax by quick steaming out through sprue hole (low heat because center of mold is not heated over 250° F.)

(4) Hit or Miss Technic—Over open flame, or on plate, in contact with rings. The latter technic, I hope, is almost obsolete, as it must be obvious to the least thoughtful intellect that an understanding of the effect of heat on the materials used in each step of the casting process, and a strict adherence to certain rules is absolutely essential to the production of uniform castings. No longer are we content to gaze with rapt admiration on an occasionally accurate reproduction in gold of our wax pattern. Our goal is one hundred per cent castings, and with present day systematized procedure, almost one hundred per cent results may be obtained by the careful technician.

Materials

The manufacturers have given us materials amost ideal for our purpose. Let us look for a moment at those commonly used.

Waxes. Inlay waxes are composed of beeswax, paraffin, resin, in proper proportions, to which is added coloring matter. These constituents have been so well blended that it is unnecessary for me to discuss the relative merits of the various constituents of the waxes. The better combinations of waxes may differ in hardness and elasticity, but when manipulated, they exhibit certain physical characteristics common to all waxes, namely, expansion, contraction, elasticity.

Taggart's and Caulk's waxes seem to come nearest to the ideal for our requirements, but call for a more careful handling than others. They are somewhat harder, will take a sharper impression without crawling, when properly manipulated and because of the higher temperature required to soften, hold their shape better in the mouth and when kept for subsequent casting. Kerr's wax, and others, are softer and more pliable, probably more popular because of these attributes.

Action of Waxes

Dr. Price and others have given us sufficient proof of the stretching properties of wax and the results of careless

technics. When wax is softened and manipulated, the molecular arrangement is interfered with and the consequent re-grouping occurring during process of cooling causes a stretching which, if not minimized, will have a serious effect on the fit of the finished casting.

Dr. Van Horn says that casting wax has a coefficient of expansion of one per cent for every 20° F., in rise of temperature. If this is true, and it seems reasonable, then the coefficient of contraction being equal to the coefficient of expansion, we have a volume change of approximately two and one-half per cent between the temperature of the water in which the wax is heated, namely 125° F., and the open mouth temperature of 80° F. to which the wax is chilled. Our great problem is to know how much shrinkage we have to contend with when this expansion and contraction is completed and how best we may minimize same.

May this not be best minimized by so shaping the cone of wax that the soft tip is inserted into the cavity as nearly as possible at right angles to the gingival seat, thus concentrating and condensing the wax against the gingival wall? This close relationship may be somewhat lessened as the temperature of the wax recedes to the temperature of the closed mouth, but if the pressure is kept constant, and a stream of water at room temperature directed onto the wax, the force of the occlusion, and that of the matrix, being greater than the intermolecular attraction of the wax, it is chilled and the elasticity fixed at a temperature which prevents it from assuming any shape other than that of the cavity.

Some waxes are put up in stick form, necessitating a re-shaping for convenient use, so as an additional precaution if stick wax is manipulated to cone shape, so that tip of cone may be softened and hard end used as a plunger, it is wise to chill whole cone, then re-heat to desired softness, without further manipulation, before inserting into cavity.

Wax at 80° F., is somewhat pliable and by use of sharp curved cutting instruments, the wax may be cut and shaved off, bucally and lingually, always cutting as much as possible toward the margins, by this means accomplishing a certain amount of burnishing. This is accentuated by the use of china silk in strips, used in proximal surfaces, burnished toward the margins, and wrapped around the pliers for pits and fissures. These help to re-adapt the wax pattern to the cavity wall, thus compensating somewhat for any loss in volume consequent to the heating and manipulation. Now the question arises, if the contraction of the gold is thus somewhat overcome in the bulk at the margins, what about the volume of cement between the casting and the tooth structure, other than the margins? It seems that we are at the cross-roads referred to by Dr. Ottolengui. Down one road go those who make gold fillings retained by cement; down the other, those who prefer cement fillings retained by gold. I am frank to confess that clinical observation in using a systematized technic has certainly proven that the vast majority of those inlays, in which cement at the margins is not discernible to the naked eye, or the joint between the filling and the tooth is not evident to the touch of a very delicate explorer, show a very high percentage of success, if the proof of the pudding is in the years of useful service, irrespective of whether they belong to the former class or the latter.

Investments

Basis, or binding material, of all investments is plaster of paris and the heat resisting compotent silex. The greater

proportion of plaster in the investment, the smoother will be the casting but the more liable to check under excessive heats. Inversely so, the greater the silex element, the greater the heat resisting properties but the more porous the investments and the rougher the castings.

Plaster of paris is prepared by slowly heating the native gypsum sufficiently to drive off the first molecule of water of crystallization, which begins to be given off at 175° F., and is entirely

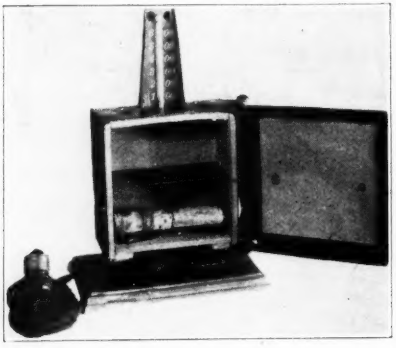

Fig. 1

eliminated at 260° F. (2) then grinding the gypsum to powder. The user adds again the molecule of water of crystallization together with free water and re-crystallization takes place.

If, in the burning of the gypsum, the temperature be raised to, or about, 480° F., and then ground into a fine powder, it will be found to have lost its power of dehydration, and in this state, it will not set when mixed with water, and it is said to be dead burnt. In other words, in a high heat casting process, the investment assumes a dry, powdery form, entirely unfit for casting. Hence the necessity for some uniform method of accurately measuring and controling the heat to which the investment is subjected.

I prefer an electric furnace with a thermometer in the top. I have used a Maves furnace for several years with gratifying results.

There are many simple methods of constructing a heater. At the Royal College of Dental Surgery, Toronto, W. E. Cummer has had the students make one cut of a standard electric switch box lined with one-quarter inch asbestos mill-board. A coil is placed in the bottom with switch attachment and shelf above on which to place the rings.

This may be modified to use with gas burner, a plate being placed above the opening at the bottom to spread the flame. A thermometer is placed in the opening in the top.

Golds

Pure gold, originally the most in vogue, proved too soft, pitting and wearing of contacts resulting. The ease with which it burnishes and draws over margins is the great factor in its favor.

Dark 22k. gold,—a copper alloy may be used with fair results, being preferable to the silver alloys and the lighter golds, on account of its hardness.

I prefer Tinker's "T" and "TT" platinized gold, which is practically as follows: For inlays: ⅔ Ney's dark 22K. gold and ⅓ S.S.W. cast clasp gold; for abutments: ⅓ Ney's dark 22K. gold and ⅔ S.S.W. cast clasp. These golds are very hard and will not pit on the surfaces, or wear on the contacts, as readily as the softer gold. A combination of pure gold and platinum will also give excellent results if combined in proper proportions.

The Present Status of the Casting Technic

The present discussion as to the most acceptable method of casting centers on the advisability of retaining, partially dissipating, or entirely eliminating the wax and carbon residue in the mold.

Low Heat Eliminating Wax

A technic eliminating the wax entirely by steaming out process, is undoubtedly the quickest and easiest method of making a given casting, and in many instances where time is the all important consideration, must be resorted to. The results in many cases are very pleasing but are not, however, in my opinion, as uniform as those of a low heat technic.

At no time does the investment become heated to over 250° F. The binding material of the investment, plaster of paris, is not disintegrated but the gold picks up a little silex during the casting process, and occasionally, a slight binding results, especially where the dove-tail is accentuated in a cavity preparation.

The casting is as smooth, probably smoother, than when a high heat is used, but it is not possible to secure the burnish that is present when the wax is retained and carbonized.

In a high heat technic, in which the temperature is sufficiently high and of such duration that the wax is completely volatilized, the investment, as we have seen, assumes a dry, powdery, form unfit to produce accurate castings, and the writer cannot see any necessity for this procedure, or advance any arguments in its favor.

Where the wax residue has been violated, there appears to be some enlargement of the casting, some interference with the walls of the mold, some brushing off; it may be of particles of investment at the narrow points in the mold, the silex thus picked up being visible on the casting, producing relatively an enlargement of the gold over the wax pattern.

Low Heat Maintaining Wax

Carbon is one of the best deoxidizers of gold that we have at our disposal and, if eliminated, the very substance most valuable in the prevention of oxidization of the gold is thereby lost.

When the wax is retained in the mold, and carbonized, the carbon residue seems to fill the pores of the investment and acts as a wall between the investment and the molten gold, preventing the rubbing off of the fine particles of investment by the gold as it passes into the mold, thus eliminating this binding so often encountered. This is especially exemplified in M.O.D. cavities.

By proper dissemination of the wax through the investment, and heating to proper temperature, any degree of carbonization may be produced and the length of time and temperature producing the best results adopted. This takes time. Time truly is a consideration, time is money to the busy dentist, but one hour consumed by the assistant in the laboratory cannot compensate for fifteen minutes lost at the chair grinding and polishing a casting in order to make it go to place in the cavity.

Very little brushing is required to remove the investing material after casting is made, the casting coming out smooth and bright. The casting thus made is the nearest to a reproduction of the wax pattern in gold, both as to fit and polish, that I have been able to attain.

Shrinkage of Gold in Relation to M.O.D. Cavity Preparation

It would be presumptuous on my part to enlarge on cavity preparation. So many excellent preparations have emanated from skilled operators in Chicago and the middle west. One or two points, however, are pertinent to the topic under discussion.

Dr. Ward (4) says that the coefficient of shrinkage for an inlay, one quarter of an inch in diameter is 0.0016.

Gold, unfortunately, contracts toward its largest bulk, which in the case of an

M.O.D., for example, is toward the proximoclusal angle of the gold and in all directions away from the occlusal, and with a drawing, together of the axial walls, the metal at the gingival shrinks toward the largest bulk, namely, the approximoclusal angle; causing relatively a thickening of the gold over the step, with the result that the inlay binds on seat of cavity and will not go to place, consequently a space is apparent at the approximogingival margin. This physical property of the gold cannot be overcome by a quick cooling, cold mold, or other means, and is particularly noticeable in three-quarter and full cast crowns; an amalgam die being necessary to overcome this property by swaging to place.

To overcome the contraction in many M.O.D. preparations the wax must be relieved or gold ground away over the step. It is also advisable to have at least a 15 per cent flare to lateral walls and a 15 per cent taper to axial wall of cavity. The gold will condense slightly in the lateral walls, pure gold more easily than the alloys, and if relieved over step, the inlay will seat at the gingival before axial wall of inlay binds on the pulpal wall of cavity.

In the three-quarter crowns for anterior teeth, as prepared by Dr. Tinker, little loss of length is encountered due to the fact that gold is of almost uniform thickness, the increased bulk across the occlusal not being of sufficient volume to seriously affect the casting.

Systematized Cast Gold Inlay Technic

My technic is simple yet accurate and efficient, one that requires no special high priced equipment, yet a technic that any one with an average amount of skill may follow easily, and follow with accurate results. I believe lower heating and lower temperatures make for simplicity and exactness, and even allowing the greater factor of personal equation to enter, is it not easier to do the same things many times a day with the same result, than to be a creature of variable moods and vary our technics with every varying disposition?

Gingival Margins

Gingival margins should be exposed by packing back tissues so that trimmers and chisels can be used, Tomkin's Prophylactic Files, Nos. 1, 2, 3, 4 being very useful for this purpose. When dull, if sent back to factory for resharpening, each time they become smaller and easier to work in between close gingival contacts. Chisels used: Black's Chisels Nos. 77, 78, 79 and 80.

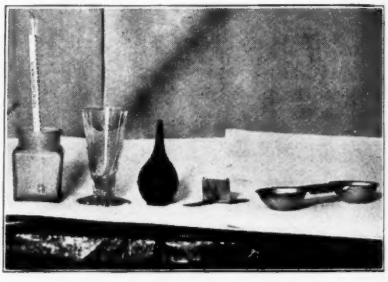

Fig. 2

Appliances and Instruments Needed in Casting Process Are:

1. Dairy thermometer. 2. Cold cream jar and ear syringe. 3. Measuring glass. 4. Taggart's weighing device. 5. Dry plaster bowl and spatula. 6. Furnace, gas or electric, with thermometer.

Wax Carvers

I have found the following wax carvers very useful: Ebersole No. 1, Schonbeck's Nos. 1 and 2, Ward No. 1. Also two or three of my own design.

Matrices

Blue Island Aluminum Bands 36 gauge, are indispensable for anterior three-fourths crowns, and for the pos-

terior teeth in places where the adjacent tooth is missing or where contacts permit its use. They are heavy enough to permit of concentration wax and yet thin enough that they can be easily slit and removed before carving the wax impression.

Wagner Matrix

The Wagner Matrix or similar, for compound cavities is an indispensable article. The square shoulder of the holder, forces the band against the tooth and holds the band firmly while it is being tightened thus forcing the wax into every part of the cavity.

Handling Wax

Fix a handle (a glass-handled push-pin suggested by Dr. Chayes) to a large cork and attach several pins to the under side and on these pins spear the cones of wax, the cork and wax are then placed in water at 125° F. When sufficiently plastic remove and dip tip of cone into water 130° F. repeatedly to soften the tip and use the hard end as a plunger to force the soft wax into every part of the cavity.

If a matrix is used, and Wagner's matrix is invaluable for compound cavities, keep the wax slightly ahead of the matrix and force into place. When patient has closed teeth, tighten matrix gradually and force the wax into every part of the cavity, then chill to mouth temperature previous to relieving the pressure. Carve as much as possible before removing the matrix, carving occlusal with instruments that carve to a pre-determined angle, namely, Schonbeck's Nos. 1 and 2. Remove matrix and carve proximal with curved wax-carving instruments, leaving if possible a small excess of wax above margin which excess is smoothed off by rubbing and burnishing.

A good curved carving instrument may be made of a No. 5 Rival Instrument, (Clev-Dent) by sharpening the blade above and below, or one of my own design may be used for this purpose. Finish the carving of the occlusal and then burnish with china silk, held between the fingers for proximal surfaces and wrapped on pliers for pits and fissures, leaving a tuft at the end which will, if sufficient care is taken, work into the fissures and burnish without scratching. In some cases the contact between the adjacent teeth is so close that the use of a matrix is contraindicated. In this event, insert the tip of the wax cone at right angles to the gingival seat and use the fingers of the left hand as a matrix, buccally and lingually and thus condense the wax in all directions. This is the only instance in which I would favor softening of the occlusal in order to obtain the markings of the opposing teeth. The close contact with the excess, will hold the wax fairly well into place and a partial carving may be accomplished. By repeatedly, carefully, softening the surface wax before removing the excess in the interproximal space, the occlusal may be carved to its normal bite.

It will be found extremely difficult under ordinary circumstances, to soften the wax on the occlusal, after the interproximal wax has been removed, or after removing a matrix, and to again apply pressure to secure the markings of the opposing teeth, without causing the pattern to become warped.

The wax pattern is removed with an explorer. If the pattern is to be kept for subsequent casting, a wineglass with sticker attached, to which patient's name is written, is placed on shelf and pattern placed in water in same, which will be room temperature.

Wax pattern is placed in hollow of the hand with sprue warmed in bunsen flame and inserted into wax.

Investing

There are many factors entering into the investment of the pattern all of which have an important bearing on the final result, among these being the length, diameter and thickness of metal ring, the density of investment materials, and the distance of the wax pattern from the end of the ring.

It is obvious that the more porous the investment, the greater the ease with which the contained air will escape of the incoming molten gold. Some operators advocate the double investment, with the more dense investment, adjacent to the pattern, the whole mass then surrounded by a very porous investing material, the claim being made that a smoother casting and sharper margins result from this procedure. I believe this to be advisable when casting large pieces, as saddles, etc., and sometimes in these large castings a wax lead is necessary to allow a gateway for the escape of contained air. But in the casting of smaller pieces, such as we have under discussion, the results do not seem to justify the expenditure of time necessary for the additional mix. If the operator will bear in mind the factors before mentioned and place the wax pattern as near the end of the ring as safety will permit, the investment will be found to be sufficiently porous to permit the air to escape and gratifying results may be obtained for the extra care.

The thickness of the ring will have an effect on the amount of heat required to affect wax. The ring we will consider will be a Roach.

The wax pattern is now mounted on sprue-former and washed with equal parts of alcohol and water to remove blood and saliva which may have adhered to same, afterward, washing the wax in water at room temperature, to overcome chilling by alcohol wash. Blackwell (5) says: "Evaporation of alcohol from a wax covered thermometer-bulb caused a lowering of temperature of thirteen degrees F. After expiration of thirty seconds and of sixteen degrees after sixty seconds. The same wax covered bulb, washed with room temperature water, caused a change of five degrees after thirty seconds and eight degrees after sixty seconds." Therefore, this appears to be a necessary precaution in maintaining as nearly as possible, our uniformity of technic.

On bench in laboratory a handy article to have is a cold cream jar, kept filled with water, which will be at room temperature, averaging probably around 70° F. A rubber ear syringe is kept in jar for convenient use and will hold just about enough water (5 drams for Roach ring) for one casting and may be used to place water in measuring glass as a drop may quickly be taken out. It is almost indispensable in transferring water from weighing device to rubber bowl.

I have tried every investment of reputation on the market, have combined silex with plaster, and graphite, but the best results have been obtained with Kerr's Combination Investment, which has proven sufficiently porous to permit of free access to the escaping air, at the same time, being dense enough to produce a smooth casting.

The five drams are measured out and placed in the Taggart balance and enough powder is added to Taggart's weighing device to balance the water. The water is put into a dry plaster bowl with the aid of the rubber syringe. The investment powder is sifted into same, spatulated very little, but bowl is rotated sufficiently to allow all bubbles to escape (three to four minutes with Kerr's Combination. Investment being an average mix). When sufficiently mixed, paint

the pattern, using a camel's hair brush as an applicator, and pour the material into the ring. It is best to wait until the process is so far advanced that the investment will almost maintain its position as this minimizes the chances of bubbles forming around the wax pattern.

If bubbles are present on the casting, it is due to faulty investing, sufficient time not having been allowed for bubbles to form and disappear.

The investment is left to set from forty to sixty minutes. Up to one hour it increases in crushing strength and best results are obtained if not left longer. Under no circumstances should investment be left to set over night as in doing so, the uniformity of our technic is lost. The free water of the investment evaporates and experience has taught us that an air-dried investment is more liable to check than one dried by heat after having been allowed to harden for a given time.

Heating

The ring is now placed in furnace, on low, and heat is gradually increased to 105° F., the melting point of wax, 145° F. (Taggarts) which takes about twenty minutes. During this time the investment will have dried sufficiently to act as a blotting paper, absorbing the wax as it melts, and not allowing it to bubble out of the sprue hole. If it is allowed to bubble out, explosions are caused in the mold and this seems to produce a roughness on the walls.

If several investments are burned off at one heating, a slightly longer time will be required than if the furnace contains only one or two.

The heat is rapidly increased to 400° F., taking about twenty minutes, and held there for one hour and a half. If the rings were to be taken from the heater and opened, at the expiration of this time, it would be found that the wax has been carbonized to a slate black color, which degree of carbonization I believe gives the best results.

Casting

The amount of gold for a large inlay should not be in excess of 5 dwt. of amount required for inlay, (for a small inlay the excess should be considerably less), and should be cast at a temperature as little above the melting point as will give a sharp casting. Super-heated metal injures a mold, so use just enough heat to fuse the metal and to keep it fused until the air is dispersed and the mold is full of molten metal. Fuse metal with oxyhydrogen flame or similar.

Clean the gold each time it is used, on a charcoal block, with equal parts of potassium nitrate and borax, thus eliminating any elements that may be picked up during the process of casting.

It is with a great deal of fear and trepidation that I even mention hot mold, or cold mold. Seeing however, that I have mentioned the topic, and still live, it might not be amiss to point out the advantages of a funnel shaped sprue-former. A good casting machine is one in which the gold is transferred from the crucible into every part of the mold and cooled in the shortest space of time. A good casting machine is essential to good casting and there are quite a number of such on the market. A machine in which the air pressure is registered and kept uniform, undoubtedly has many advantages. The Taggart machine has long been the machine par excellence and after many years it still maintains its supremacy.

I use a Roach centrifugal machine, because of its simplicity of operation and smoothness of motion. The gold is quickly transferred from the molten to a solid condition once the molten is applied, and the motion serves to cool the gold quickly.

A funnel-shaped sprue-former accelerates this motion by a small fraction of a second and therefore is preferred.

Cementation

Finish inlays in pits and fissures before cementation by use of Inlay Finishing Burs, Nos. 1, 2, 3, Clev-Dent, followed by felt cone and wheel brush on a lathe chuck.

The cement should be mixed thoroughly to a thick, creamy consistency and the cavity almost filled. The average filling should go to place with a tap from orangewood stick and leather mallet, or an orangewood point in an automatic mallet.

It is wise in M.O.D. castings to apply the necessary force from two points, parallel with the long axis of the approximal portions of the inlay, by notching a stick until it rests on these two points. Hold the inlay under pressure until the cement has fairly well set, and when all danger of the casting moving is past, the margins are disked where possible and any stoning is left until the cement has set, or for another sitting.

Every cavity should be so prepared that the inlay will act as a wedge, forcing out the excess of cement and compressing the remainder into the smallest space possible.

Gingival Margins

The gingival margin of the average inlay has long been the bane of the prophylaxis specialist and of the periodontist. This unnecessary labor might be considerably lessened if more care were taken in the trimming and finishing of same with files and gold trimmers.

Conclusion

In conclusion, I would pay a silent tribute to those who have made possible the systematizing of a cast gold inlay technic, a tribute of sincere appreciation for their unselfish efforts, for their unceasing toil. They have gathered together and we have builded, and if this building is so fitted together that someone may bridge over a few difficulties, and be helped to the better understanding of their casting technic, I will feel amply repaid for my efforts.

Bibliography

1. Van Horn. *Items of Interest.* Vol. LXII, (1920).

2. Shoemaker, Edwin. *Dental Cosmos,* Vol. LXII, (1920), p. 1178.

3. Chayes, Cast Gold and Porcelain Inlays.

4. Ward, Marcus L. *Dental Cosmos,* Vol. LI, (1909), p. 1052.

5. Blackwell, R. E. *Jour. Nat. Dental Assoc.,* Vol. VIII, (1921), p. 447.

Discussion

R. E. Blackwell, Chicago, Illinois: Some one has said that given a good cavity and a good wax model he could make good inlays by a number of methods. I think that is true. First in importance is the cavity preparation and, second, the wax pattern.

The outline form for the gold inlay cavity should not differ to any great extent from the outline form for a cavity for an amalgam filling or a gold-foil filling. There are a few men who seem to think that because an inlay is put in with cement the margins are protected as they are not under other fillings and that the outline form need not be extended to include all the area of liability. Certainly the margins of the inlay are no more immune to caries than are the margins of any other fillings.

We all know that the gold-foil filling takes advantage of the elasticity of the dentin and that the dentin exerts a grip on the filling. In preparing cavities for gold fillings, most operators have prepared cavities with flat seats and definite angles for resistance form, not depending upon the grip of the elasticity of the dentin alone to prevent the filling from moving under the stress of mastication. I maintain that if it is necessary to prepare a cavity with a flat seat for the gold-foil filling, it is doubly necessary to prepare a cavity with a flat seat for the gold inlay, so that the inlay will not have a tendency to move under stress of mastication. The retention form should be considered with care. The dove-tailing, if that method is chosen,

should be done in such a way as to cause a definite interlocking of the inlay and the tooth. If the dove-tailing is very definite the inlay cannot help but go to its proper position when placed in the cavity for cementation.

Finally, the cavity for a gold inlay must have the undercuts removed and the walls must be smooth. It takes time to do that, much more time than to prepare a cavity for an amalgam filling or even for a gold-foil filling. We must have the proper tapering of the walls and the walls must be smooth. I have talked to many men with the purpose of getting their ideas of this matter of cavity preparation for gold inlays. I thought it might be a good idea to judge of their cavity preparation by getting the length of time they thought necessary for this work. I asked, "how much time do you think necessary for the proper preparation of a proximoclusal cavity in a molar tooth for a gold inlay?" I asked thirteen men,—I will not mention their names but they are all men of recognized ability and only two said less than half an hour. Six of them said forty-five minutes was a minimum in the average case. One man I called up said, "I was talking with so and so at luncheon on that very subject and we agreed that forty-five minutes was the minimum time." Some of them said that they allowed an hour for an appointment and spent most of it on cavity preparation. I think this gives you a good idea of what good men consider necessary in the way of time for cavity preparations. We must eliminate the thirty minute appointments if we are going to do good inlay work.

Dr. Clappison mentioned the difficulties involved in using a matrix to secure a wax pattern where the teeth were thick necked or had fallen together on account of abnormal interproximal wear. It seems to me, that such cases call loudly for separation. We should provide interproximal space and secure the full mesiodistal breadth of the tooth for that inlay, or perhaps a little more than the full mesiodistal breadth of the tooth.

As far as the laboratory technic is concerned I can heartily agree with almost everything the essayist has said. We must have a standardized laboratory technic. As he has suggested, his may not be the only one but we should have a standardized technic. I think each man must decide for himself what his shall be. I do not believe we have any right to make inlays unless we are willing to spend a little time in the laboratory now and then and find out whether or not we can make inlays that actually fit the cavities they were made for. In an article by Dr. Ottolengui which appeared in the *Dental Cosmos* for 1915, he said to avoid extremes of temperature in making gold inlays. That thought has remained with me. In softening the wax do not overheat. The water used in mixing the investment material should be at room temperature. Do not raise the temperature of the water and expand the pattern because you may cause distortion of the pattern. In dissipating the wax, use the low heat dissipation method. Some time ago I was trying to dissipate wax at about 320° F. At that time I was using the kind of thermometer commonly used on a vulcanizer; but since I have had a more accurate thermometer, and one of Dr. Maginnis' ovens. I have found that it takes more heat than that. I have to raise the temperature to 400° to get accurate castings.

I should like to say a word or two about alloys. Sometime ago there was published in the Bulletin of the Chicago Dental Society some results of tests made to determine the hardness of the various alloys for casting, and it seemed that because some alloys tested very hard and showed a very small percentage of shortening under different pressures they were considered the best to use. I will give the results of a few of these tests. Pure gold under one hundred pounds pressure was compressed four and one-half per cent. Under two hundred pounds, nine and one-half per cent. Under three hundred pounds, sixteen per cent. As the average bite of the normal adult man is about 175 pounds, it would seem that pure gold is too soft to stand up well under the stress of mastication and to withstand interproximal wear. If we are going to use pure gold we should harden the occlusal surface with solder; the contact points also should be hardened with solder.

Dee's No. 2 special inlay gold was shortened 1.92 per cent under two hundred pounds pressure. That is very hard gold, and it might give the idea that it would be ideal to use, but in my opinion it is not the ideal one. It is too hard.

S. S. White special inlay gold compresses about two and one-half per cent under two hundred pounds. This also is too hard.

I believe that an alloy for a gold inlay should be soft enough to permit of trimming in the mouth in much the same fashion that gold-foil fillings can be trimmed. It should be hard enough to withstand the stress of mastication and yet not be more resistant to occlusal wear than is the enamel of the tooth.

At present it seems to me, that 22 carat gold comes nearest to meeting these requirements. It is soft enough to trim away in the mouth, and yet it is hard enough to withstand the stress of mastication.

A word about contour and contact. If a

gold inlay has a place as a filling material it has earned that place not because of the decreased wear and tear on the patient and the operator, but because it gives us an opportunity to make a perfect proximal contact and a proper contour. It gives us an opportunity to try as many times as we like to make that contour and contact ideal. We may make good contours and good contacts with amalgam fillings and with gold-foil fillings, but if we take off a little too much in finishing we will have to do the operation over or do a part of it over in order to get the result we desire. In the gold inlay work we may cast our gold inlay without attempt at contact, as many of us do, place the inlay in the cavity to be sure that the marginal adapation is perfect, mark the place where the contact is to be, and form the contact point with hard solder. The inlay may then be replaced in the cavity and the contact point tested for tightness, for buccolingual width and occlusogingival width. When it is perfect the inlay may be set. I think for that reason, if for no other, the inlay has earned its place, probably the first place as a filling for proximoclusal cavities.

C. N. Johnson, Chicago, Illinois: We are likely to forget history but Dr. Clappison made the remark in his paper that Dr. Taggart was the father of the casting method.

Let us go back and think a little of history. When inlays were first made they were made with the matrix method, and in many instances very beautiful work was done. That was long before the Taggart method of casting was introduced. We were trying to perfect ourselves in that technic as best we could and in some instances got good results, but when Dr. Taggart came along and gave us the cast method what happened? Instantly the land was filled with the odor of burning wax, and we are smelling that odor yet. This profession will never be able to pay Dr. Taggart the tribute he is entitled to. The name of Taggart will live in the dental profession as long as we try to save teeth.

Another thing, Dr. Clappison said something about condensing the wax against the gingival wall. We cannot take a piece of wax and simply push it into a cavity and get the best results. The wax must be condensed, and the pressure must be maintained over the whole area with the thumb or finger.

Now the question of high heat and low heat. There is no doubt that an investment is left in much better condition if we dissipate the wax with slow heat. There is no question about that. As Dr. Clappison has said, if we use high heat we leave the investment in almost a powder form. Yet there are exigencies that arise that necessitate the latter method. I think it will aggregate about three hours if we use the slow heat and it is not always possible to spend that time, even in the laboratory on these cases. I am not making a plea for high heat, but sometimes we do find that the higher heat does come out well. In every case where we can we should use the low heat method.

When Dr. Taggart brought his method out, he gave us a technic which was more carefully worked out than that of any other process ever introduced in dentistry, and the fundamentals are almost the same today as when he gave them to us in 1907. He told us then why to use a cold mold. There are, however, times when an inlay is needed as rapidly as we can get it, and I remember when a clinic was given here by the Illinois State Dental Society on its fiftieth anniversary, a lot of inlays were made for test purposes and one gentleman brought me some particularly beautiful castings. I complimented him and he said, "Yes, Doctor, I cast those in a hot mold." It jarred me just a little bit,—we do get jarred sometimes.

I want to say a word about the matter of cementing an inlay to place, and to make a confession. Dr. Clappison intimated that it was not necessary to say anything about so simple a process as that before this Society. I want to confess that my chief difficulty in securing satisfactory results in the matter of gold inlays has been in cementing those inlays to place. I have been able in many instances to get a result that pleased me, I do not mean that it satisfied me—we are never satisfied, or should never be, but a result that pleased me, with a good occlusion so that I knew there was no undue impingement, and the contacts good and then have cemented the inlay to place and the first remark the patient makes is, "Oh Doctor, that hits!" I have had that happen so frequently that it is to me the bugbear of inlays. I do not seem to be able to place an inlay always in exactly the same position when that cavity is filled with oxyphosphate of zinc that I can when the cavity is empty. Possibly I have been making a mistake in one particular. I believe that when we cement an inlay we are sailing all the time between Scylla and Charybdis. We are on the one hand making the cement so thin that it is lacking in stability, or we are making it so thick that it will not permit the inlay to go perfectly to place. I believe my chief difficulty is in mixing the cement too thick.

I enjoyed Dr. Blackwell's discussion very much. He mentioned a thing I think very important, and that is the cavity preparation. I believe the work of cementing is facilitated greatly by the proper preparation of the cavity, giving it flat seats for the inlay to rest upon. If you have a flat seat and force an inlay to place, it is more likely to go perfectly to

position than if the inlay is situated on a curved base. Another thing is that we want to make pressure, especially in a large inlay, over as much of the surface as possible, and I do not rely for the perfect seating of an inlay upon the way Dr. Clappison suggested. I do not use an orangewood stick or an automatic mallet, but I use a steel plugger and a heavy lead mallet covered with leather. I want a mallet which carries the impulse a long distance. The light steel mallet does not carry the impulse far but the soft heavy mallet does. A boy in my chair expressed this very beautifully one day. I was inserting a gold-foil filling and had my assistant use a soft heavy mallet. Then I picked up the light steel mallet and used it to harden the surface of the filling. When the boy got out of the chair he picked up the heavy soft mallet and said, "This thing jars you right to your feet, but this little fellow (pointing to the small steel mallet) just stings the tooth." That expresses it perfectly. In an M.O.D. inlay when I do not feel sure of getting the impulse over the entire area I use some pink unvulcanized rubber and then have the patient bite down as hard as possible. I do not use red rubber because it is not so satisfactory, but in some instances with the pink rubber the patient can do a better job than I can.

Dr. Clappison mentioned the fact that these gingival margins were the bane of the man who practiced oral prophylaxis, and it is a fact that an overhanging inlay margin is a bad thing for the gum. But I do not think it should ever be necessary to use a file on them after they have been cemented. We should put the inlay to place, test the margins with a fine explorer and trim the margin out of the mouth, so that there are no overhanging margins. Dr. Blackwell has said that it does not seem possible to prepare an inlay out of the mouth and have no overhanging margins here and there, but if it is ever possible it is at the interproximal area.

As I look back over the whole development of the inlay process and think what has been accomplished even in a few years I am most optimistic about the future in this particular line of work. I am an optimist in dentistry anyway. As I see these young men coming along and bringing us new ideas, bringing new blood into the profession, I am inspired.

P. A. Pyper, Pontiac, Illinois: You and I today are doing a lot of things that we think are absolutely essential and fundamental when they may only be an incidental. We are trying to make ourselves believe that a wax can be melted and molded and expanded and not come back. We are trying to believe that an investment compound may be mixed up into a plastic mass and that we may then do anything we wish to it without having it change its form. That is impossible with any investing compound we have today. Heat will expand and cold will contract them, and this same physical force is true in regard to metals.

When we have an excessively large gold inlay we will get the effect of this expansion and contraction, although in a small inlay this will not be perceptible.

The Boston College of Technic has tried every known physical force used in casting to try and prevent the molten mass of gold from shrinking when cooling and found it was impossible to overcome the shrinkage.

Some of our men have been trying to use a centrifugal machine and others air pressure or air suction to overcome this shrinkage, but up to date there is no machine that will overcome this shrinkage. If we could only have a research committee and summarize the possible forces and eliminate the impossible.

The gold inlay is not a new subject, but there has been many different processes for making them, as the late Dr. Ames taught us how to make them in 1893. There were many discussions in those days as to the usefulness and durability, and in 1903, at the Illinois State Dental Society meeting, when the discussion of inlays, both gold and porcelain, were at their highest interest, the late G. V. Black arose and said there never has been and is not today an inlay or any process of filling a tooth that is any better than the old pounded in gold filling for the preservation of the teeth, and I think that Dr. Johnson believes that is true today.

Many of us know that the border between the gold and tooth is the most impenetrable that we can get when the gold is properly condensed. Today we have no one process that is a greater benefactor to the profession and to humanity than the gold inlay.

In the early days of casting, we used a 20 carat gold: First, because it melted easier; second, because it cast easier, because the globular molecule affinity was less, in fact the lower the carat, the less the globular molecule affinity and the higher the carat, the higher. Hence we must recognize this affinity in our casting force. The higher the carat, the more force is necessary to overcome the affinity, and the lower the carat, the less the force necessary.

Here is what happened with the 20 carat gold and I anticipate it will happen with all the harder golds. After a few years, we will have the inlay standing away up the tooth surface abraded down, due to the difference in mechanical abrasion of the occluding surfaces.

I think the nearest to the tooth in this

respect is the old pounded in gold filling as Dr. Johnson has just described or that mechanically tempered surface. It seems to mechanically abrade the same as the tooth.

One other point Dr. Clappison spoke about and that is we must have a porous mold. Let us note how the sand molder gets this by taking a wire and punching little holes through the upper half of his mold, so when the molten metal runs into the mold, the air escapes through these holes.

Now the same can be done in gold castings by taking a piece of (Angles) regulating wire and heating one end and inserting it into the wax pattern at the point where the gold will force the air into, when inverting, let this wire run up along the outer side of your inverting ring, and when you pull out your sprue, pull out the wire and when you force your gold in through the sprue hole the air will escape through this wire hole.

James H. Prothero, Chicago, Illinois: One point was mentioned by Dr. Clappison and repeated by Dr. Johnson and that is the method of setting inlays. I think many overlook the physics involved there. It is a matter of physics with the central portion located in the center and it seems a thousand miles to the margin of the cavity. That means that the cement is sometimes thin and sometimes thick and many of you try to force that excess cement out with a steel mallet or some other way. It is not possible to force it out that way. When I was a little fellow and we used to have taffy pulls it used to be a joke to have someone hold a ball of taffy and have someone else strike that ball of taffy with a hammer. It would feel just like hitting a stone because the taffy would not yield to the heavy impact, and yet one could press his knuckle right into the taffy. It is just the same effect in using the mallet in the filling—it will not force it out. It is not the right kind of force. It requires heavy, steady, continuous pressure and not too much force to get rid of it. There is not much space between the walls of the inlay and the walls of the cavity. When there is no cement in there and the walls of the cement are not there you have then the thinnest possible quantity of cement between the walls of the cavity and the inlay. You cannot drive it out by heavy force, it must be done with steady pressure.

Victor T. Nylander, Chicago, Illinois: It is essential to finish the cavity to the finest detail so that the pattern will be perfectly free, with definite margins and no binding. A mistake is often made by using a crosscut fissure bur in finishing a cavity thus leaving rough and rounded cavosurface angles. A single cut fissure, or taper finishing bur, or a fine stone of the same shape is far more efficient for this purpose.

The investment is a mechanical mixture and frequently in shipping it long distances the silex will sink to the bottom of the can, due to the difference in specific gravity and properties of the ingredients. The investment will then not respond uniformly in mixing nor to heat. By remixing the preparation prior to using it the results are apt to be more uniform.

Letting the pattern stand too long before investing or after investing before burning out the wax tends to weaken the sharp margins and renders it liable to slight distortion. The restoration should therefore be brought to completion as quickly as possible after the cavity has been made.

Dr. Clappison, (Closing): Dr. Blackwell spoke of the cavity preparation. In speaking of cavity preparation I feel that this is not on my program—flat seats and steps for resistance and retention are essential. When I received the invitation from the Program Committee I was told very plainly to stick to the technic of gold inlays, and I did not consider that it was essential for me to consider the preparation.

In the thick-necked tooth, after obtaining sufficient separation, this is a good suggestion. I wish someone would suggest some quick means of securing a little more separation. I find that very difficult. Technic models for experimentation, I think, is the one essential for good inlay workers—getting into the laboratory and seeing what one can do.

Dr. Pyper spoke of systematizing the work. That is something that would be a godsend if we could arrive at a place of agreement.

I use a stone whenever possible, plain fissure burs and stones; on the other three-fourths where discs are useful by all means use them.

Dr. Prothero spoke of setting the inlay and keeping it at a proper angle and that is very important.

THE SUCCESSFUL DENTAL ASSISTANT[1]

By RUTH A. CARR, Chicago, Illinois

(Read before the Indiana State Association of Dental Assistants, May 15, 1923)

IT GIVES me a great deal of pleasure to appear before this Society to present a paper on a subject which is of such great importance to all of us, and while I shall not be able to impart all the knowledge I would like to, due to the broadness of the subject, still I want to leave with you my ideas regarding some of the most important things that go to make an efficient and successful assistant.

All great fundamental principles are, when revealed, simple and easily usable. The secret, if it is a secret, of success, is no exception to the rule. Two words comprise the story of what is required in any business or profession—they tell the qualities that make one woman forge ahead of others who in native ability appear to be her equal—and these two words are "intelligent service." Is not the work of the dental assistant the same as the dentist's, in that hers is a call to service? Therefore, her great aim in making a success should be to serve intelligently, and to be happy in so doing.

First of all, she must be interested and like her work, for no one really becomes successful doing something they do not enjoy. I love my work, and for this reason I do my utmost to give the very best there is in me, and am always on the alert to learn new things and better ways of carrying on my various duties.

On the other hand, no one who is really ambitious and desirous of making a success in life can make her work the exclusive aim of her efforts. One important aim should be to keep physically fit, to do the greatest things she is capable of doing. If she keeps physically fit she will keep mentally fit, and this is most necessary, for her mind must be constantly on the alert. In order to become successful in aiding the dentist and being of proper help to the patient, the assistant must obtain a clear vision. Clear vision comes from clear thinking, and clear thinking comes from actual knowledge and dependable information. Clear thinking, based upon dependable facts, marks the successful young lady, the young lady of decision and action.

We oftentimes hear of assistants who are discouraged because they do not seem to advance, and feel that what they do is not appreciated. That of course may happen in a few cases, but the average dentist is very quick to notice improvement in one's service, and is willing to extend the reward. Such an assistant should ask herself whether she is applying herself diligently and doing her part toward increasing the dentist's finances, thus enabling him to give her her just reward. Does she take the responsi-

[1]Upon the recommendation of Dr. Otto U. King, Secretary American Dental Association, this paper was also read before the Indiana State Dental Society, May 16, 1923.

bilities of running his office in a dignified and efficient manner, so that the dentist can devote all his time to work at the chair? Does she bear in mind that all material rewards come in return for service of one kind or another? Intelligent and willing service is not born by chance or genius, but is the result of one thing, and one alone; that is, knowledge. The old saying one hears so often—"we are never too old to learn"—is a good one to bear in mind. I do not remember going anywhere or talking to anyone that I did not carry some information away with me. Sometimes I learn things entirely new, and on the other hand, sometimes discover that my way of performing certain duties is more simple and effective.

To learn more about our duties so that we may serve intelligently often requires much time and study outside of our office hours. However, if we are really anxious to do things in the best way possible, I am sure the sacrifice of a little pleasure is worth our while. I never regret the time I put to use in this way, because I obtain such good results afterward, and such great pleasure in knowing that I am of proper help to the profession. I am sure every girl has intellectual self-determination. If she allows her ambition to lag, and her machinery to rust in the prime of her powers, she has only herself to blame. She cannot expect to win out in business without self-denial, self-improvement, and self-applied observation.

When I started my work as a dental assistant I knew nothing whatever of the duties connected with such a position. This I explained to the dentist who was employing me, but I told him I would do my very best, and would try to the extent of my ability to fulfill his requirements. I can proudly say that from the day I started up to the present time, I have continued to advance both mentally and financially. My assistance was of such a nature that I benefited the dentist to the extent that his business and financial returns for the first month were greater than any month in his previous twelve years of practice. I have continued to do my part in increasing each year's income over the preceding year. In a very short time I proved to the dentist that I was a help to his organization, and not a detriment. I enabled him to give me my just reward, and because I have constantly helped to increase his finances, mine in return have likewise been increased. I do not expect to stop here, for every day I am looking for newer and greater things than I can do to be even more successful.

Some of you may wonder how to go about increasing the dentist's finances, and this may be done in many ways. I have never been able to figure out why so many patients go to a doctor or dentist, and expect (as they always do and should) the very best of advice or treatment, whichever the case may be, and go away without even mentioning their financial obligation for services rendered. My theory, although it may not be a very good one, is that way back when the medical profession came to light, they were so interested in performing what in those days were so-called miracles, and trying to do good, that they neglected to instruct their patients in regard to business matters. In turn, the dental profession did likewise, until they have now come to an age of wisdom and understanding that in order to run any business or profession in the right manner, and give to humanity the very best that science has to offer, they must be paid sufficiently to give thorough and accurate service.

The dentist is in one sense a salesman, and the thing he has to sell is his

time and the knowledge and experience that goes with it. Why should not the patient pay for his services, the same as they pay any salesman for a gown or wrap? Many dentists are too busy and feel it is rather beneath them to have to mention the financial end of their business. Here is where the efficient assistant can be of utmost help. My usual manner of imparting the obligation to the patient is as follows: "Mrs. So and So, the charges for the doctor's services are such and such an amount. Would you like to pay something on account, or how do you wish to take care of this?" Nine times out of ten the patient pays me right then, or asks for the statement so they can mail me a check on the following day. Others, who have been given an estimate on their work, and neglect to mention how they will take care of it, I handle in this manner. When their work is completed, I make out their statement, and handing it to them, say, (always being sure to mention their name first) "I have made out your statement, and would like to have you look it over to make sure it is in accordance with the estimate given you. If there are any questions you would like to ask regarding it, I shall be very glad to help you." The patient always thanks me, and states when I may expect a remittance.

We must be very pleasant and diplomatic about these things, and the patient will be pleased with our efforts and in turn do business with us in a like manner.

By these methods, what do we accomplish? First, we have eliminated the necessity of sending numerous statements for the same accounts; second, we have eliminated having too much cash outstanding; and third, we have and are teaching the patients to transact their business with the dentist in a business-like manner. Above all, we have enabled the dentist to increase his day's business by continuing his work at the chair with the next patient.

Another aid toward increasing the dentist's finances is to realize and know the value of his time. As I have stated, it is his time he has to sell. Know what the value of his time is—what it costs him per hour to run his organization—and aid in making his receipts for each hour greater than his expenses, thereby granting him a reasonable profit and making his work worth while. Remember, every moment we can save the dentist means better work and more returns financially.

We must be tactful in conversation over the telephone, for it is easy to give a wrong impression. We must be pleasant, and remember to speak over the telephone as though we were in conversation face to face with the patient. We must be able to meet the many difficult situations which daily confront us, and which are too trivial to demand the attention of the dentist. When the doctor is called to the telephone, ask to take the message. In most cases the assistant can give the desired information. This also holds true when people call in person. I inquire whether the call is professional or personal. If personal, I ask their name, and if they refuse to state their business or give me their name, I treat them accordingly, for as a rule they are agents of some kind. If it is necessary to inform the doctor of a call, either personal or professional, I do not mention the name in the presence of the patient in the chair, but write it or any other information I wish to impart to the doctor on a pad provided for this purpose, and at the back of chair show it to the doctor.

When a patient arrives for his first visit I secure the name, business and

residential addresses and telephone numbers, also the name of the party by whom the patient was referred, and place these on the chart. If the doctor can give me some idea as to the extent of the work to be performed, I make a series of appointments with the patient. This saves time, because it avoids making appointments after each sitting, and the patient is benefited by securing the days and hours most preferred.

Another important duty is the attitude toward the patient. I could write at great length on this subject, for there is so much to think of, especially when approaching a patient. I am sure there are none of us who are not at all times cheerful. A smile does a great deal in any business or profession, and is of especial help in the dental profession. In many cases patients are suffering, and if not suffering are not looking forward with great joy to a visit to the dentist. The assistant can play a great part toward cheering up the patient, as the dentist cheers them up by relieving them of pain. Radiate sunshine, for everyone loves it. Every courtesy should be shown the patient at all times, especially while he is in the reception room. We all have a few patients who perhaps overlook our little attentions and take them as a matter of course, but we must not let them discourage us, but continue to do our very best.

I am going to tell you of an experience of an assistant a few weeks ago, which it was my pleasure to witness. This assistant was informed by the reception room attendant that a young man wished to see her, to make an appointment. As she entered the reception room she discovered that every chair was occupied and several people were standing. The young man who had asked for her was one of those standing. She approached him in her usual manner, with a smile, and in a pleasant tone, said, "How do you do? What can I do for you?" The young man gave her his name and explained that he was a patient of Dr —, but had not been to visit him for several years, and wished at this time to make an appointment. The assistant arranged a satisfactory appointment, and said goodbye. As she was about to leave the reception room, a gentleman who had been standing nearby walked toward her, saying, "I beg your pardon." She in return said, "Yes, sir." The gentleman then said, "What is your name?" A little startled, she said, "My name? Why, my name is Miss —." He then said, "Miss — I am James Hamilton Lewis, whom are you with?" The young lady proudly told him, "Dr. —." Colonel Lewis then asked her if she would be kind enough to deliver a message to the doctor. She replied that she would do so gladly. He said, "You tell Dr.— that a strange man was standing in the reception room and saw a young lady approach another strange man, and that he wished to pay a compliment to her and also to Dr. —, and that it was the most tactful approach he has ever seen or heard in any business." What a fine tribute to receive from a great statesman, and internationally known lawyer!

Were not her efforts worth while? Was not that compliment an incentive to continue being tactful and pleasant? You see, we never know who notices and appreciates our efforts, but if we treat each and every patient in the same way, we are serving the dentist and the patient to the best of our ability. If you are not sure whether you are serving your dentist in the right way, and doing the various things he requires, just ask him this question—"What would you most look for in a dental assistant, if you were hiring one now?" When he gives

you his answer, try to live up to his standard, and in this way you can see your shortcomings, and improve on the things you perhaps neglected unknowingly.

Above all, the assistant must be loyal to the dentist. If she is not loyal, no dentist wants her, once he finds it out. And rightly so. Loyalty must be one hundred per cent. There is no room for mixing it with one grain of disloyalty. It must be undiluted. What does loyalty demand? Any young lady's conscience can and will and does tell her that. Happily, being loyal to the dentist means that the young lady must be loyal to herself, and everything that is fair and honest and decent. Believe in the method your dentist uses in performing various operations, and his method in running his office, unless you can in some diplomatic and nice way show him ways in which these things can be improved. To succeed she must play fair, but play with all her strength of mind and body, and keep playing that way. Too many young ladies think too much about securing advancement for themselves, and not enough about advancing the interests of the dentist's organization. Think first of your organization, and sooner or later you will not be overlooked. The better, the stronger, the more prosperous you can make the organization, the better and stronger and more prosperous you will become.

The personality of the assistant means much to the dentist. Just what do we mean when we say personality? It is hard to define, but it might be summarized as being everything a person is and does. It is being natural, being one's self, not the putting on of winning "airs" such as we so often see in both business and social life. Be yourself, and you will be loved, esteemed and respected by those who know you and by those whom you daily serve.

Useful achievement is the real thing to strive for. To have and to merit the approbation of the dentist with whom you are associated and the good will of those who know you, is an accomplishment worth striving for. And, incidentally, the possession of such approbation and good will smoothes the pathway to advancement toward wider responsibilities and wider usefulness.

In order to succeed we must love achievement, not because of the glamour of the reward, but because of the joy derived from getting things done, particularly things difficult of accomplishment, and which were a service to others. As I am striving to accomplish greater things, I often repeat to myself a little poem which I learned some time ago, the author of which I have forgotten. Perhaps it will be of help to you, so in closing let me say—

"You need not wealth, the world needs you,
To give, and not to take,
Not for yourself great things to do,
But do for others' sake.
The world is his, the east, the west,
Who serves not self but serves the rest."

FUNDAMENTAL PHYSICAL CINEMATICAL PROBLEMS

By FRED W. FRAHM, A.B., D.D.S., Los Angeles, California

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)

THE making and supplying of dentures to those of the human race who are unfortunate enough to lose their natural organs of mastication is not entirely a problem of anatomy esthetics and mechanics. Primarily it is first and foremost a problem of physics and cinematics. However, I do not lose sight of the problems that arise, and are associated with the foundations upon which the dentures are to rest and function. Many of our failures can be directly charged to an unfortunate selection of the case for a given method or the selection of methods with which the operator is not familiar. Either of these will bring ultimate grief to the practitioner.

There are a number of men who are single-track practitioners. They are men who will abandon their former methods and are then carried away with some passing idea without giving it any serious consideration. Another man may partially master a method and equip himself to the last degree for such a method without a full understanding of its application. This is good enough as far as it goes, but unfortunate for himself and his patients; the latter must all fit into this method and equipment, losing every individuality and most of their peculiarities of masticating function. The law of averages may come in and do some rescue work for both, but most of the average cases go down to disappointment for the patient and defeat for the operator. The number of these could be reduced if more care and judgment had been used in the selection of the cases, and a study of the method which would best serve the requirements of the case.

Impressions, toothforms, denture outlines, anatomical and esthetical requirements must be considered and cared for. But they are secondary and not fundamental. The mechanics that are involved are secondary to the cinematics, but they must harmonize with the other factors. The equipment must be compatible with both, if we are to have the measure of success to which we are entitled. It is very sad, yet quite true, that the technical requirements for using the equipment are made as simple as possible, even to the extent of damaging the results, because some men will not put forth the required effort to master the functional problems that are involved. Not infrequently the advocated technical procedures are built with the view of increasing the commercial value of the required equipment rather than to solve the involved cinematics. This may be charged to the rank and file of our men, rather than to the commercial technician or manufacturer.

The selection of our equipment is becoming a larger problem with each succeeding year. New men, methods and equipment are appearing on our horizon with ever-increasing numbers; each—so they say—with the panacea for which we have been looking. Many men are tempted to, and do depart from tried and proven paths of practice, to purchase a new method and equipment at an unreasonable price, only to find that this new hope or vision was a mirage. The great refining fire has been and will ever remain the clinical results of our cases in practice.

It may be unkind to say it; however, it is quite true. If an automatic prosthetic equipment could be designed, no doubt, it would prove popular with a good many men. Yet, it is quite refreshing to note the ever-increasing number of men who are spending a great deal of time each year in study and experimental work in this particular field of practice.

I have had the privilege of doing some pioneer work in what is now known as spherical articulation. I demonstrated that the mandible was not an equilateral triangle, and that the sagittal plane was the logical plane from which to make measurements and deductions for our denture work. I also stressed the fact, that there is no fixed axis that might be accepted as the point of rotation. I believe that this axis is near the sagittal plane varying from three to five inches above the plane of occlusion, that this axis is shifting in all directions, depending upon the type and size of the mandible, and the muscular control of the same within the limits of certain anatomical factors peculiar to the individual. The late and beloved George H. Wilson, in his article on "Fundamentals," said: "Upon these new thoughts—Christenson, Bennett, Gysi and Frahm,—Drs. Rupert E. Hall, George S. Monson and J. W. Needles have each invented and introduced anatomical instruments. Thus a new school of theory and practice of artificial denture construction is developing, but it is not wise at this date to ascribe to the new school any set of concrete principles further than that it is seeking for truth, simplicity and efficiency." This so-called school is still in the embryonic stage. It has not seen the light of day or been able to move from its own fixed axis. It has ventured a radius of four inches in several directions, and I hope they will see fit to enlarge by moving the center and increasing the length of the radiating lines, to enable them to do more specific and individual work. Dr. Wilson says: "This school has no right to come into existence unless it is superior to any other school of its kind existing." I am of the opinion that this school will never attain any growth, or live one-tenth the time that the old school has lived, as long as they advocate and practice the things they now teach which are not fundamental in principle or harmonize with anatomical, physiological and cinematic requirements of mastication. If this school would seriously consider the anatomy of the parts involved in only a limited number of cases and the clinical data of the cases that come to us in practice they would have to modify their line of reasoning. Neither of these two fields of investigation would support a fixed axis for a sphere with a radius of four inches. The contention that they are basing their work on the law of averages is only a sop thrown out for us to take. A scientific mind would not be satisfied with averages of any kind when he has to plan and build for individuals. It would be like carrying coal to New Castle for me to quote skull measurements in support of this contention. Our literature is full of these, and any man may acquaint himself with the facts if he will only read.

Stress

Stress may be somewhat difficult to consider in denture work. However, the kind and direction of stress our appliances must withstand cannot be ignored. This feature of our work is of more importance than any other factor entering into denture construction. In considering the stress we also must consider the involved physics and cinematics. I am of the opinion that the findings of Dr. Gysi still stand unimpeached and fundamental, that any future research will always point toward the principles laid down by this man of science. I also believe that R. L. Hanau's work and study of the cinematics of the mandible will prove to be fundamental. After a careful study of H. J. Prentiss' work in the anatomical laboratory of the University of Iowa, and an open consideration of his findings, we must conclude:

First, that the peculiar type of each masticating unit must be considered individually and not collectively.

Second, that the condyle paths and the temporomandibular joint influence to a large extent, the movements of the mandible.

Third, that the mandible is not a floating member of our anatomy, a sort of a "will-of-the-wisp" affair. That it has very definite and peculiar movements for each case.

Fourth, that the axis of rotation never, never, can be a single predetermined fixed and arbitrary point.

Many men give only a brief consideration of the cinematics of the mandible and then draw conclusions as arbitrary as the laws of gravity and chemistry. Such conclusions are of little or no value, for they are based on ignorance. To ignore or attempt to minimize the facts that are involved in our problem, deprecating all real scientific efforts to solve them, will not gain for us the results we are after.

A man may ignore the toxicology of strychnine and assume that it is harmless, because he has never seen any fatal results due to its careless use. But this does not change the fact that strychnine is a poison when taken in certain amounts. Likewise, a man who ignores or will not recognize the complex movements of the mandible during mastication does not alter the fact that there are certain factors that influence, limit and control the movements of the mandible. Also that the range of movements in one case differs from that of another because the influencing factors are not the same.

Ignorance of the principles, slipshod methods, or arbitrary and careless use of averages, have no place in the mind or work of a conscientious and scientific searcher after the truth.

The involved geometry and cinematics of mastication is an interesting and ever refreshing subject to study, because of the variation of the relationship of the factors that are involved. These variations are so numerous that we may assume them to be countless. However, the primary factors that are involved, which influence the intermaxillary and mandibular relations aside from muscular cavity or control are, as follows:

1. The triangular construction of the mandible.
2. The size and type of the right and left half of this triangle.
3. The right and left side elevation.
4. The distance of the condyle path from the plane of occlusion.
5. The degree of inclination of the right and left condyle path.
6. The relation of these condyle paths to the ever-shifting axis.
7. Peculiarities of structure and anatomical features of the temporomandibular articulation before and after the loss of the teeth.

Muscular influence and control of the mandible and its peculiar suspension enables this osseous member to move in function more freely than any other bone of the human body. But it moves only in harmony with certain physical and geometrical laws. To reduce these movements to a fixed average and at the same time ignore the flexibility of the factors that influence these movements is not a forward step. Dr. Hanau asks the capital question "Is it permissible to use a nonadjustable mechanism based on averages or should we have an adjustable apparatus to comply with the anatomical conditions and with the technical selections?" Then he proceeds to reason why he answers it in the negative. Any student of the cinematics of the mandible who has had training in geometry and physics can easily follow Dr. Hanau in his logic. Then, after carefully considering the facts, he is certain to arrive at a similar conclusion. I have always maintained and still hold that the application of the law of averages to this problem is the shifting quicksand that will gather in and send into oblivion those who seek justification for their inaccuracies beneath its surface. However, we must take into account the fact that all of our present-day equipment is not developed as it should be to meet our scientific requirements. Not infrequently very able men are willing to accept anything as long as it appears to be something new or different in the line of instruments without first considering its real merits. Again, if my reasoning is logical, there is no common ground upon which the so-called two schools can stand. The resiliency of the base upon which our denture rests can never entirely equalize the strain upon our restorations without harmful and destructive results to the temporomandibular articulation, and the tissues upon which the dentures are seated.

Again, if we assume the mandible to be a floating member and a lever of the third class when in action, we may assume any arbitrary axis for its function, and destroy both condyles without any loss in function. Because we are not fully able to understand all the movements of the mandible is no reason for the assumption that the condyles do not function during mastication. There are still quite a few functions associated with our bodies that God alone can explain, and He alone can give the functional reasons for the temporomandibular articulation.

It is safe to say without successful contradiction, that the mandible is the most freely movable bone of the human skeleton. The forces which are responsible for this free movement differ very little in the various types of cases that we may consider, but the geometrical problems that are engendered by these movements are another matter for our consideration. Our cinematical deliberations must be based upon both the forces and factors as we now understand them. Most of the muscular forces responsible for the movements of the mandible are of interest to us only when the mandible is brought into relation with the maxillae in the act of real mastication. We do not pretend to make dentures that function as the natural teeth do when they are held in their sockets with a healthy periodontal membrane. Neither does the unusual positions or movable speed of the mandible concern us. However, we must never lose sight of the fact that the mandible moves as a unit in all its parts, that we cannot ascribe a plane for the incisors and another for the molars, which does not synchronize with the established planes upon which right and left condyles move. That the facets upon the teeth which are the result of wear, harmonize with the synchronous

points of mandibular suspension and the condyle inclined planes. An articulator with a fixed incisor pin guide path is faulty, because a triangle rotating on one of its points or angles should allow the other two angles to move along synchronous inclined planes. The incisor guide pin plane would have to be made adjustable to compensate for the variation in the anteroposterior position and lateral positions of the case with an adjustable condyle path.

The cinematics of the articulator should harmonize with those of the human articulator as far as it is possible. It might be interesting to know that all of the simple anatomical articulators when used without the incisor guide pin path function similar to a spherical articulator that has a four-inch radius.

The primary muscles of the mastication when in action with the resultant parallelogram bring upward traction on the mandible with a distal and inward direction, as George H. Wilson has so ably discussed in his two recent essays read before the American Dental Association. The parallelogram of forces in its parallel relationship to the sagittal plane of the skull must remain one of the foundation principles for the cinematics of the mandible. To this we must add the factors that modify and give individuality to each case, and the lateral parallelogram of forces which are at right angle to the sagittal plane of the skull, if we would account for the complex movements of the mandible.

In 1914 some of my findings in the study of the cinematics of mastication were published in the *Cosmos*. I took for my foundation in this study the sagittal plane of the skull and set forth the theory that there was an axis of movement somewhere near this plane. I am forced to admit that this was not a fixed point but a "shifting axis." It would be unscientific and not in harmony with the factors and laws governing the cinematics of the mandibular movements to assume a fixed axis for the arcs of articulation. This axis or center may be found medially or distally to a point in the sagittal plane. It may be located at a point higher from or closer to the plane of occlusion thus shortening or lengthening the radius and curving or flattening the arcs upon which the teeth move. Or, it may be found to be a little to the right or left of the sagittal plane. This latter variation is not so great as the other two; however, it is one of nature's methods of equalizing the two unequal halves of the masticatory triangle, and we should not ignore it.

After this center has been located by careful measurements there are two other factors that modify the movements of the mandible. Namely, the inclination of the condyle path and distance of this condyle path from the plane of occlusion.

In an unbiased study of our problems, we will have to admit that the inclined path of the temporomandibular articulation with its discus articularis has an influence upon the movements of the mandible; also we will find that such inclination in the path is not the same in all individuals or even the same on both sides of one person. The variation in the degree of inclination of the condyle path on each side is nature's second attempt to harmonize the two unequal halves of our masticating unit. There exists a very definite relation between the condyle path of each side and the type and size of that side of masticating unit. Then by adding together and harmonizing these four primary factors with the one remaining one, namely the distance of the condyle path from the plane of occlusion, we can explain why the mandible moves in function without strain or destructive changes to its several anatomical parts.

Muscular control or influence has very little to do with the movements of the mandible after the tooth cusps are in relation during the crushing of the food other than determining the amount of applied force. It is almost needless to say that the muscles guide the mandible into position for action as definitely and accurately as the muscles of the arm and hand guide the pianist in striking the right keys to make beautiful harmony. But such shifting movements do not control the cinematics of our problem.

We may have a strongly developed set of muscles that shift the parallelogram of forces backward, making the mandible a lever of the second class, or it may shift forward so that the axis may shift to a variety of positions, eventually terminating in a distinct lever of the third class, but such freedom of action will never be permitted unless the other factors are favorable. This free movement of the mandible does not concern the prosthetist for it does not enter into the problem until we get contact either between the teeth themselves or between the teeth and the food. It does not give us license to ignore the primary anatomical factors that enter into and influence this movement and assume that we can compel the mandible to move in function from any one arbitrary axis without due consideration being given to the geometrical factors that are involved.

In conclusion, I wish to emphasize first, the fact that the mechanics of articulation cannot follow an arbitrary predetermined method that does not correlate with the functional requirements of each case; second, that the functional peculiarities of each case differ from those of the other to the extent that dentures for the one could never function in the mouth of another; third, some men would have you believe that an arbitrary single-track method and equipment is reasonable and satisfactory for all cases; fourth, that the functional movements of mastication will not permit us to ignore anatomical features peculiar to each patient without causing serious physical and functional disturbances that will never be repaired or compensated for; fifth, the closer we adapt our method to the plan of the Creator—the greater will be our success.

IMMEDIATE DENTURE RESTORATION

By VICTOR H. SEARS, D.D.S., Salt Lake City, Utah

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)

IMMEDIATE Denture Restoration implies that dentures are inserted before the patient leaves the extracting chair. Many of us have attempted this service in the past but the more teeth there were to extract and restore the less probability there was of obtaining proper adaptation and occlusion, particularly if the case required alveolotomy. The difficulty lay in the fact that we attempted to adapt dentures to jaws, the exact forms of which were not determined until after extraction.

From a mechanical standpoint there have been two serious problems in attempting this type of service: First, the surgical preparation of the jaws to an extent which would permit the seating of the dentures and at the same time without unnecessary loss of alveolar process; and second, the close adaptation of the dentures to the jaws.

The technic described and illustrated is offered as a means of simplifying both of these problems.

Facial measurements, photographs, etc. of the patient are made according to the needs of the case. Full impressions are made of both jaws, including the teeth and the tissues to be covered by the proposed dentures. We shall consider in this paper only the technic of constructing the maxillary denture.

The impression technic employed is of minor importance. Plaster casts obtained from the impressions are occluded as one would occlude orthodontia casts. The casts thus occluded are attached to an articulator so that during the subsequent steps the jaws remain in the same relation to each other, (Figure 1).

The plaster teeth are now cut away to make room for the substitutes. At this point the technic will depend upon whether we wish to restore exactly each tooth to the position occupied in nature or whether we wish to make certain changes in the teeth and facial contour. If the teeth are to be restored as they were, the plaster teeth are cut away and the substitutes replaced one at a time. If, on the other hand, it is desirable to make changes, it may be advisable to cut away all of the teeth on one side of the cast and trim the plaster jaw to the desired form before setting the teeth of the trimmed side, leaving the other side intact to gauge the direction and amount of alteration, (Figure 2). After having set the teeth in wax the trial denture is removed from the cast and the cast is further smoothed, if necessary. The trial denture is then replaced upon the cast and completed in the usual manner.

The only thing unusual to be done to the completed denture is to polish the ridge portion so that the healing tissues will be held in position by a smooth sur-

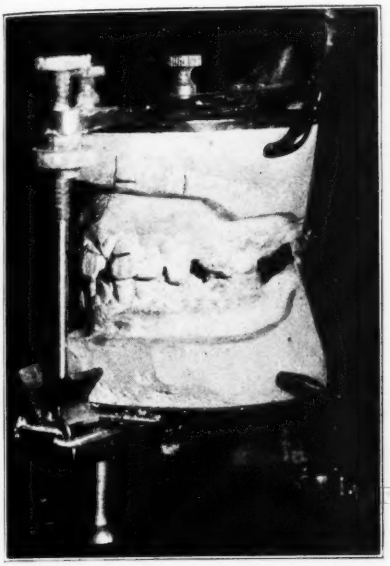

Fig. 1

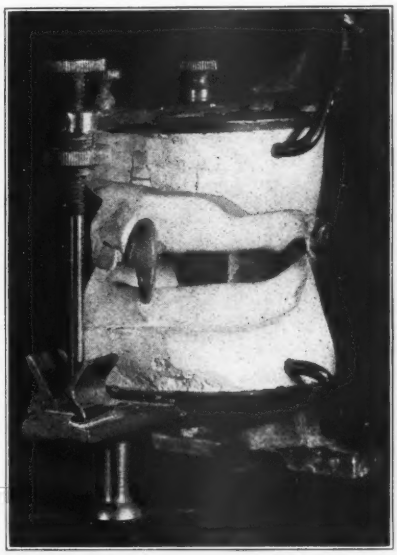

Fig. 3

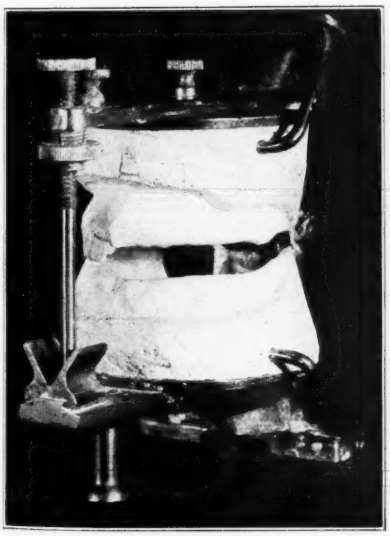

Fig. 2

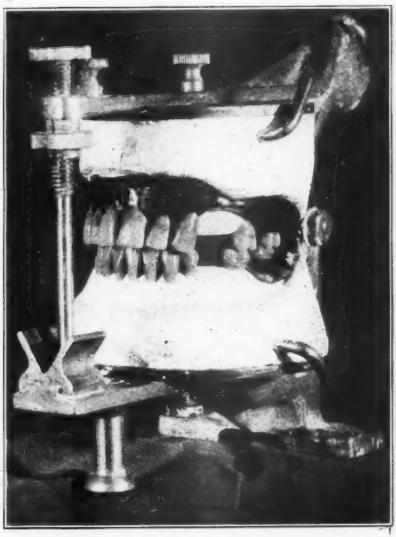

Fig. 4

face. Incidentally, if at any place too much of the plaster cast has been cut away at the time the teeth were set up, the error may be corrected at this point by trimming away the rubber from the tissue side where the error has occurred.

With the denture completed and polished on the tissue side we are ready to make the form which is to guide the oral surgeon in preparing the mouth to fit the denture. This form which is made of transparent celluloid is an important link in the chain and is made as follows:

A cast is run into the completed den-

Fig. 5

ture. When set the cast is removed and invested in the lower part of a flask. When the investment has set a separating medium is applied to both investment and cast and the second part of the flask is filled with plaster. This forms a die and counter die between which a sheet of transparent celluloid twenty-five one-thousands of an inch thick is pressed. The celluloid may be softened in alcohol or the softening may be accomplished by heating the die and counter die.

The resulting form is a transparent base which is to determine the form of the jaw. Inasmuch as both the denture and the transparent base fit the same cast it is obvious that if the jaw is made to fit the transparent base, it must also fit the denture. Conversely the denture must fit the jaw and we have achieved our aim. It follows that the prosthetist need

Fig. 6

only supply the oral surgeon with a transparent base of the desired form in order to indicate the exact surgical preparation decided upon.

With the teeth removed the oral surgeon approximately prepares the jaw

Fig. 7

and tries the transparent base in the mouth to test for adaptation. Because the base is transparent it may be easily seen where the adaptation is imperfect. In this manner it is possible to trim the alveolar process until there are no pro-

jecting areas to keep the base from being fully seated. When the transparent base fits the jaw the denture will also fit the jaw and may be inserted. Suturing is a matter of choice but it will be clear that the denture will hold the tissues in position acting as a splint.

Upon inserting the denture pressure is applied to the jaws by the operator in order to seat firmly the denture and to assure full occlusion. With the denture in position the patient is dismissed.

Some judgment will be required in the after treatment but it seems that healing is often quite satisfactory if the denture is left in position without removing it for any purpose within a period of about three days.

SUMMARY

1. Plaster casts are made of the jaws, including the teeth and the area to be covered by the denture.
2. Casts are occluded on articulator.
3. The maxillary teeth are cut off and the cast is trimmed to the desired form.
4. The denture is constructed on the cast thus formed.
5. Die and counter-die are made from the cast poured into the completed denture.
6. Transparent celluloid base is pressed between die and counter-die.
7. Transparent base is used by the surgeon to secure desired jaw form.
8. The denture is inserted and the patient dismissed.

BEAUTY AND DENTISTRY

By MISS M. TEW, Los Angeles, California

(Read before the National Society of Denture Prosthetists, Los Angeles, California, August, 1922)

IT IS assumed that, as denture prosthetists you are ready to pledge as loyal allegiance to your artistic sense as to your scientific sense. Being true to both, you cannot separate them, nor trust one more than the other. It is a pity we do not have the same feeling of nearness and trust in art that we do in nature. If some of you feel that your artistic sense is too weak to be trusted, you have only to let art help you strengthen it.

Cultivate your sense of beauty in general, and apply it in particular. It is upon the sensitiveness of the nervous system, whether natural or acquired, that the sense of beauty depends, and studying to acquire this sense is a discipline, not an indulgence. Study all growing things, books and great architecture, painting, and sculpture, and most of all the faces of your fellow men. Search out *difference* of feature and *similitude*—variety of form and balance of masses. By searching, your discernment will become acute; you will be able to avoid the "almost nothing that will mar everything." Study the harmony of faces; note the homogenity of ugliness as well as the homogenity of beauty. There is a relation between the smallest traits of every part of the face. No one feature of a man could ever be exactly adjusted to the face of another. Learn this great lesson. Nature does not compose a face by matching detached parts—her organizations are not patchwork. Nature operates from the interior to the exterior. The solid parts, independent of the fleshy, are the real bases of drawing and painting. Then comes the study of each facial muscle, its attachments and manner of action, and the resulting effect on the form and expression of the face. Form is the greatest foundation of facial art. You can find hundreds of faces alike in coloring of hair, eyes and skin, but no two alike in form, and it is the form of the mouth and adjacent parts that the greatest individuality lies. No wonder Herder wrote this concerning the mouth: "What a sublime miracle among so many miracles which compose my being! I conjure you, ye painters *and all other artists,* who undertake to represent the figure of man, to study the most precious of all his organs, in all its shades, all its proportions, and all its harmony." Among "all other artists" stands the denture prosthetist, who must do his best to preserve the beauty and usefulness of the mouth, and its harmony with other features. The following passage from an old French book "De la Plastique" is good for you to hear: "Below the forehead stands that beautiful frontier, the eye-brow, in its mildness, the rainbow of peace; the bended bow of discord when it expresses rage: *****. The nose combines, and gives a finishing, to all the features of the face; it forms, as it were a mountain of separation between two opposite valleys—the root of the nose, its ridge, its point, the apertures through which it respires life—how many expressive signs of the understanding of character! We

have now reached the lower part of the countenance, which nature, in males, surrounds with a cloud, and surely not without reason.**** It is well known how much the upper lip characterizes the taste, the appetite, the sentiment of love, that pride and anger bend it; that it is sharpened by cunning; that goodness rounds it; that intemperance enervates and debases it; the human figure is nowhere more beautifully and correctly finished, than in the upper lip, at the place where it closes the mouth. The use of the upper lip is to serve as its support. It is, besides, of the greatest importance to observe the arrangement of the teeth, and, conformation of the cheeks. A pure and delicate mouth is one of the strongest of recommendations, the beauty of the portal announces the dignity of the passenger; here, that illustrious passenger is the voice. The interpreter of the heart and the soul, the expression of truth, of friendship, and of all tender affections. The upper lip begins already to form the chin, which is terminated by the jawbone, descending on both sides, as it rounds off the whole ellipse of the face, it may be considered as the true keystone which rounds off the arch of the edifice.

By studying some portraits remarkable for harmony we see how true are the foregoing statements.

Applying your sense to beauty in particular, you will find it most helpful to study *one* mouth *well*—draw and model it fifty times. The mastery of one is the mastery of many. You can model many more, and see those points which are individual and those which are universal. You will develop a dependable sense of line, mass, and proportion. Especially study the mouth and adjacent features in profile. The great sculptor Rodin calls the profile the real key to the structure of the head, and the character of man. Some day one of you will surely work out a means of so placing artificial teeth that the profile will not be altered as it now is. In choosing the best color for artificial teeth, a sense of gradation, rather than color, is what you need. Study gradation in nature, in white clouds or gray; in neutral tints such as the bark of trees, shells, stones and stems of plants; the delicate gradation in black and white drawings and etchings.

There are eminent authorities on the medical and physiological aspects of dentition, and some of you should specialize sufficiently to become an authority on the esthetic aspects of both natural and artificial dentition. You probably know that the earliest dentistry practiced in America was on a purely esthetic basis. In pre-Columbian times the natives of Central America operated on the tooth by staining, filing or cutting the ends into different forms, and by the insertion of foreign substances into or through the enamel. Decorative inlays of turquoise, jadeite, obsidian, and gold have been found in skulls dug up in Mexico and Yucatan; but among thousands of mummies found in Peru there was not one with filed or inlayed teeth.

De Landa says: "They had the customs of filing the teeth like the teeth of a saw, and this they did for elegance and show; the work was done by women filing them with certain stones and water." So you see *earliest* authority on esthetic dentistry was a woman, and now it is your turn to be the *latest* authority. If you will study, saying sincerely in your heart "let Beauty awake," Beauty *will* awake, and at the same time will come to you many devices for incorporating beauty in your work.

The following books are recommended for study: Sulzer's "Theory of Fine Arts"; Sir Chas. Bell's "Anatomy of Expression"; Wm. Moris Hunt's "Talks on Art"; Rodin's "The Man and His Art"; Maxfield Parrish's and Jules Guerin's book on color; Pater's "Greek Studies"; and Aishoke's "Character Reading through Features."

INDUSTRIAL DENTISTRY'S CONTRIBUTION TO ORAL HYGIENE

By R. I. HUMPHREY, D.D.S., Chicago, Illinois

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)

IN CONSIDERING the subject of industrial dentistry and its value to general health, one cannot help but feel a sense of disappointment at the extremely bad condition found in the mouths of people who are working in our densely populated centers. We who have been engaged in industrial work during the past few years are probably the only ones in our profession who fully realize the extremely insanitary condition which actually exists. Oral hygiene among this element of our population has been so neglected that one sometimes wonders that the condition is not even worse than we find it to be. Many of these people are uneducated and especially so in the field of oral hygiene. The importance of such a common operation as brushing their teeth appears never to have entered their minds. Neither have they gone to dentists for prophylactic or constructive dental care, except perhaps as the result of an emergency such as a pulpitis or an acute abscess, and the only treatment many of them then received was the removal of the offending tooth.

Considering the cause of this most unhealthy condition, we should not overlook the fact that more than fifty per cent of the employees whose mouth condition we have recorded are foreign born, and that more than ninety per cent of this number come from rural districts in their own countries. From these findings it would seem that the people of rural districts are considerably less informed regarding mouth hygiene, especially among the foreign born.

Industrial oral hygiene seems to be the missing link between the care of the mouths of school children and of the better educated, more or less well-to-do people who receive periodic prophylaxis. We know that it is a comparatively simple matter to serve patients who have been taught the importance of oral hygiene from childhood, and who have the means to secure first-class service. However, this is not the case in the industrial field. We must first in some way bring to the minds of our patients the importance of keeping the mouth clean, and it is this particular phase of the work which seems to hold the greatest promise in industrial dental service. It is not a simple task to persuade all those adults with whom we come in contact to follow out a definite prophylactic program. However, our results have been encouraging enough to warrant the continuation of this service, and if possible, to add to it the support of more dentists in private practice.

The field of industrial dentistry thus far has not received adequate support

from physicians and dentists engaged in private practice. It seems that there are still a few private practitioners who hold the view that the effect of industrial work is to rob them of part of their livelihood. However, when we stop to consider this phase of the situation, we know that only a limited amount of constructive work could possibly be accomplished by men in industry, even if the number of dentists engaged in this type of work were many times greater than at present. Furthermore, the value which ultimately accrues to the private practitioner through the education of employees along this line is very considerable. When the head of the family has been convinced that the care of the mouth is highly important, he will naturally insist that other members of his family are properly cared for.

Physicians in industry are constantly coming in contact with chronic cases where oral hygiene has a direct bearing on the prognosis in the case. The close co-operation of physician and dentist in cases of this kind is absolutely necessary if satisfactory results are to be obtained. This, too, is one of the big fields in industrial dentistry, and one which is producing very remarkable results.

The following cases are typical of many which we have treated during the past six years:

Case No. 1. Male, age 35. Family and personal history negative. Patient complained of pain in muscles of neck and shoulders and had not slept well for two weeks. Physician could not find anything which would account for the trouble. Oral examination revealed four deep pyorrhea pockets. The affected teeth were extracted followed by the immediate disappearance of muscle pain.

Case No. 2. Female, age 31. Family and personal history negative. Patient complained of pain in stomach two years previous. Physician sent patient to hospital for observation followed by a diagnosis of probable gastric ulcer. Diet was recommended and after a period of six weeks patient returned to work feeling greatly improved. After about six months patient had same trouble and was sent to general hospital a second time for diagnosis. This time all the findings were negative except six teeth which were abscessed. The teeth were extracted followed by the patient's return to work and in six months the patient gained twenty pounds. Three years have elapsed since treatment, during which time there has been no symptoms of the old trouble.

Case No. 3. Male, age 37. Family and personal history negative. Patient complained of excruciating pain in left thigh of two weeks' duration. Physician's diagnosis was sciatica. Examination of mouth revealed extremely septic condition, including pyorrhea, abscesses and caries. All teeth were extracted followed by a very rapid improvement. There has been no recurrent trouble during the past four years.

A great deal has been said regarding focal infection and its relation to general health, and in some cases perhaps there has been a degree of exaggeration. However, after handling several hundred of these patients, it is really astonishing to note the vast improvement in their general health following the elimination of mouth infection.

It is a somewhat debatable question just how far we should go in the way of restorative work in the industrial field, because conditions in different localities and in different industries are not the same. However, it seems to me that in addition to the educational feature, which must always predominate, we should include such service as the immediate relief of pain, cleansing of teeth, extractions, abscess treatment, x-ray, and at least a limited amount of filling and plate work.

The two most vital points which we should always consider, are the prevention of pulp exposure and the prevention and elimination of periodontal infection. After all, industrial oral hygiene is no different from any other field of dentistry, in that the object sought is the rendering of the maximum service, and it has been the aim from the very outset of this most worthy movement to give the greatest service possible that is compatible with existing conditions.

It has been a source of considerable satisfaction to know that employers have co-operated very thoroughly in industrial dentistry. We hope that our dental organizations will take a more active and constructive attitude in helping us to render a better and more complete service to a large body of our population who are badly in need of dental service, and who were almost entirely neglected until industrial dentistry was inaugurated a few years ago.

WAYS OF INVESTING SMALL SAVINGS[1]

MANY of the letters to the Investment Editor are from people who bought their first bonds during the war. A considerable number of these people are now looking for ways to invest small sums periodically in much the same way as they bought Liberty Bonds. Their letters indicate a growing interest in bonds among people of small savings. The purpose of this article is to show ways that such small savings can be invested.

One's first savings, laid by to earn a return for their owner, or to be used to take advantage of some future business opportunity, or to start a competency for old age, cannot be better placed than in a savings bank or in a savings account in a national or state bank or trust company. A certain amount might well remain there permanently as a "rainy day fund" that can be drawn upon quickly in time of need.

After an amount sufficient to meet emergencies has been accumulated in a savings account, one can turn his attention to other classes of investments. Among these, bonds and mortgages are the best. But before considering them a word might be said about building and loan associations. In many states the laws regulating such associations are well drawn and provide a good degree of protection to those who invest money in them. On the whole it can be said that the record of building and loan associations which have confined their operations to their local territories has been an excellent one; while, on the other hand, those that have tried to operate on a broader scale have usually been unsuccessful. It is well for the investor to keep this in mind, for lately several such associations have sprung up that are attempting to operate nationally.

When it comes to buying bonds and mortgages, there are three ways for the man or woman with small savings to go about it. Either he can keep on accumulating money in the savings

[1]Every month the *World's Work* publishes an article on investments and the lessons to be learned therefrom.

bank until he has an additional thousand dollars, which is the usual denomination in which bonds and mortgages are sold, and then make such an investment, or he can buy the bonds or mortgages on the installment plan, or buy them in smaller denominations than a thousand dollars. There is something to be said in favor of and against each of these methods; but the disadvantages of the two latter are being steadily eliminated as the investment demand for securities in these ways is increasing and banking and brokerage houses are beginning to realize that they must sell securities on the installment plan and in small denominations in order to secure the investment capital that the country needs and to compete with the "blue sky" promoter, who directs his appeal to the small investor.

The danger in installment, or partial payment buying is that a great number of houses of bad or doubtful reputation are specializing in the sale of securities in this way. It affords a convenient cloak under which they can operate as bucket shops. Fortunately a few of the leading investment houses have begun to sell bonds and mortgages in this way and the small investor can now buy sound investment securities on the installment plan with safety. The "bucket shops" usually offer stocks or highly speculative bonds and the partial payment investor who is looking for safe bonds or mortgages is not likely to run much risk if he sticks to his purpose and avoids such houses. One of the best plans for him to follow is to go to his local bank through which he bought his Liberty Bonds and see if it will not handle additional purchases of good bonds for him in this same way. The progressive country banker will do this, and of course, he will only do it in the case of sound investments, for he loans bank funds against them. This is a safeguard for the investor.

But there are people who do not care to commit themselves, even tentatively, to investing a fixed amount regularly, or who do not care to start buying something that they will not get until many

BOND ISSUE		DUE	BID	ASKED	YIELD
Argentine Government	5s	1945	62	63	8.75
French Government	7½s	1941	95½	96½	7.90
United Kingdom	5½s	1937	89	90	6.50
Great Northern	7s	1936	103	104	6.60
New York Central	6s	1935	95	96	6.50
Norfolk & Western consolidated	4s	1996	79	80	5.00
St. L. & San Fran. p. l.	4s	1950	63	65	6.80
South Pac.—Frisco terminal	4s	1950	72	73	6.00
Amer. Tel. & Tel. col	5s	1946	88	89	5.90
Amer. Smelt & Ref.	5s	1947	78	79	6.75
Gen. Electric deb.	6s	1940	100	101	6.00
Atlantic Ref.	6½s	1931	101	102	6.20

BONDS IN $100 DENOMINATIONS

A list of representative bonds available in small denominations, together with the price bid for them and the price asked for them in the market on the day the list was compiled, and their per cent yield when their payment at par at maturity is taken into consideration.

months later. These people would rather buy outright bonds in small denominations as they have funds available to pay for them. It is for these people that this article is especially intended.

In the past, the person who bought bonds in less than thousand dollar denominations usually had to pay two or three or four points more for them than for the thousand dollar bonds of the same issue, and if he wished to sell, he had to take less than the market price for the thousand dollar bonds. This was a severe penalty against the buyer of small bonds. The unit for trading in bonds on the Stock Exchange is $1,000 and there is no provision for a corresponding price for smaller pieces, as is the case for "odd lots" of stock. Two $500 bonds can be delivered against a sale of $1,000, but ten $100 bonds are not a "good delivery" in such a case under the rules of the Stock Exchange. Furthermore, banking and brokerage houses do not like to sell the small bonds as there is the same amount of work in handling one of them as a $1,000 bond. For these reasons the investor who has bought $100 bonds has had to pay more for them. Nevertheless he has continued to buy them, and in the last six months the demand for them has increased greatly.

The investment banker, whose average sale to investors has dropped from above $10,000 to around $3,000 because of the heavy income taxes, has begun to see the need of catering to the small investor. The result has been that practically all the new bond issues brought out lately have been available in $500 and many of them in $100 denominations. Just now, because of the increased demand for bonds, there is a tendency on the part of some houses to eliminate the small bonds, to avoid the handling of them, but the advantages of having a wide distribution of a corporation's securities will certainly prevail, and it is safe to assume that there will be more $100 bonds in the future.

It is estimated that there are now more than two thousand different bond issues that are available in this country in $500 denominations and more than a thousand in $100 denominations. Houses that specialize in these bonds now try to make a market that varies but one point between the price they will pay for them—the bid price—and the price at which they will sell them—the asked price. This makes the price for the $100 bonds vary only half a point from that of the $1,000 bonds. Thus are the needs of the small investor being constantly better provided for.

Editorial Department

THE NEED OF BALANCE

In the practice of what has been termed modern dentistry there is an ever-increasing need of balance. In common with every other calling there seems to have grown up a tendency toward a radical departure from long-established custom, and no man is considered progressive today unless he brazenly attacks most of the professional procedures of the past. We need new ideas in this as in every pursuit of life—we need the infusion of new blood. It is the very life of any profession. But all the new is not good and wholesome, nor is all the old disintegrating, unwholesome or bad. Very frequently a new idea runs away with its advocate, and leads him to do things which are not only ridiculous, but which are actually harmful.

A case in point in dentistry is the so-called "surgical removal of teeth." There has seldom been introduced in our profession a method of procedure which has worked greater damage in a given time than has this. It has left in its wake much needless suffering and much permanent injury. One authentic case is reported where the antrum on both sides of one mouth had been opened and exposed by this senseless gouging and scraping. Mouths have been mutilated beyond repair, and patients have been crippled for life so far as the comfortable wearing of dentures is concerned. Yet so insistent have some of its advocates become that the moment a sane, conservative man utters a word of caution or protest he is at once branded as an old fogy, and held up to ridicule. There has developed a pronounced tendency among a certain class of men to ride roughshod over the ideas of some of the older practitioners in this matter. When a man of years and experience, who has the welfare of his patients conscientiously at heart, goes on record against this practice, and gives his reasons in a clear and logical manner, he should be listened to with respect instead of attacked with invective and innuendo.

After all, long experience in any pursuit prepares a man to judge as to the value or lack of value in a given method of procedure more surely than does all the theorizing or assertion of all the enthusiasts in the profession. The men who today are clamoring for "surgical ex-

traction" seem to forget that for several centuries at least teeth have been extracted without subsequent scraping or other surgical interference, and for the most part the cases have promptly healed without further trouble. The preponderance of evidence is so manifestly in favor of letting the tissues alone after tooth extraction, and so decidedly against radical measures either before or after the removal of the tooth that there would seem to be no ground for argument. In the rare cases where the tissues do not heal after extraction and where the socket fails to properly fill in and where pus persists, it is then proper to resort to surgical procedures—but not otherwise.

Let us counsel together in these matters—let us whole-heartedly confer with each other, to see what is best for our patients; and when any new or spectacular idea seizes upon the profession let us study it carefully to see whether or not it is sound in practice as well as in theory. Above all let us not berate those who advise caution and conservatism, and who, through years of loyal service to the profession and to humanity, are entitled to speak with some authority. There has been too much flamboyant assertion connected with the advocacy of "surgical extraction"—too little calm deliberation to see whether or not it would work for the ultimate welfare of the patient. The time has come when no fiat sent out by a few fanatical enthusiasts must be permitted to stampede the profession out of sanity and reason.

A MESSAGE FROM THE PRESIDENT

The first thing that attracts and holds our attention with this, the Cleveland Number of *The Journal* is the beautiful and highly significant *cover design*, which in itself sends greetings and carries a wonderful message; then as we turn the pages and carefully read the prepared program, we must certainly agree that every indication points to the fact that the coming meeting of the American Dental Association at Cleveland, Ohio, September 10 to 14, will be the largest and best meeting ever held.

Those who are in a position to know claim that never before in the history of the Association has the entire program been completed so far in advance of the meeting. At the midwinter meeting of the trustees and officers held in Cleveland the latter part of March, every section officer reported a completed program for his section; and definite plans were outlined for the early completion of the program for the General Sessions, which have been carried out for several weeks past.

With such subjects as Cancer, Food and Diet, and Dental Education to be discussed by the able authorities chosen, every General Session should prove of interest to all in attendance.

The general secretary has been busy throughout the year, always ready with such suggestions as will improve the character of our meetings and reflect credit on our profession; and if there has been a single essential detail overlooked by any member of the local committee, your president does not know what it is. The Thursday evening session affords something entirely different from anything that has ever been attempted in the way of entertainment, combined with an intellectual feast as well, and is just what we would expect from the Cleveland men.

Now that most of the state societies have held their annual meetings, the clinical program is about complete. The chairman has worked faithfully to make this part of the program one of the most attractive features. The Health Exhibit to be staged under the auspices of the section on Mouth Hygiene and Public Instruction is one of the greatest undertakings of its kind ever attempted; and it is so arranged and planned that it cannot but be a grand success. It will carry a message to the people that could not be done so impressively in any other way.

From year to year the Manufacturer's Exhibit has been attracting more attention; and in recent years this feature of the meeting of the Association has stood out in a conspicuous manner. The rapid progress of dentistry is due in no small part to the ever readiness of the manufacturer to supply our every need, no matter what the expense involved. This exhibit at Cleveland will be held in the Public Auditorium which affords facilities that should satisfy the most fastidious.

It will be seen, therefore, that all that remains to make the Cleveland Meeting of the American Dental Association the largest and best meeting ever held is for each individual member to do his duty and attend. Cleveland is a great city and has splendid hotel accommodations; and if you have not yet made your reservation, we feel certain after reading the wonderful program prepared for you and realizing what its fruition means to dentistry, you will not delay longer. This is your association, your meeting, and your opportunity. Come to Cleveland in September and return to your practice a bigger and a better dentist, carrying with you the message of the meeting—Prevent, Conserve, Progress. Is this too much to expect of the thoughtful practitioner of today?

J. P. Buckley, *President.*

Los Angeles, Calif., June 20, 1923.

THE CLEVELAND MEETING

The 1923 meeting of the American Dental Association promises to be one of the very best ever held by this splendid organization. Everything seems propitious. The meeting place is ideal—it is centrally located, and easy of access. The hotel accommodation is good, and the local committee efficient and willing.

Whenever the Cleveland men say they will do a thing, it may be taken for granted that it will be done. The Association has been fortunate in recent years in its committees of arrangements. All have worked wholeheartedly for the success of the meetings committed to their care, and we have the utmost confidence that Cleveland is not to be outdone by the others.

The program for the coming meeting is one of the most comprehensive that has ever been prepared for a dental gathering. It embraces every possible phase of dental thought and activity. It is practical, scientific and intensely interesting, treating the subject of modern dentistry from every conceivable angle. Just to look it over as outlined in the preliminary announcement is to awaken the keenest interest in what the meeting has in store for every member.

And then the impetus, the urge, the ebb and flow of thought brought out by association and personal contact with one's fellow-practitioners—this must ever remain one of the greatest incentives and chief benefits of any meeting. There can be no finer spectacle in professional life than a large body of earnest and wide-awake men and women congregated together in a common and worthy purpose for the betterment of the people they serve. It is an inspiration even to mingle with such a company as will be present at the Cleveland meeting. The South, the North, the East, the West will congregate at Cleveland because of its central location, and because of the unusual interest associated with the 1923 meeting. Last year many from the Eastern and Middle States were debarred from attending the Los Angeles meeting because of the distance, but this year no one will be debarred from any of the states.

One suggestion is made. Take the program as presented by the Committees, and study it in advance to determine how best and most profitably the time may be spent when the meeting opens. In this way every moment may be utilized to the greatest advantage. The arrangement of the various section meetings is such that a member may readily select those features that most appeal to him, and he

need not waste time or suffer confusion in planning his attendance at sections after he arrives at the meeting.

In addition to all other incentives for going to Cleveland this year is the one of loyalty. Every member of the Association owes it to the President and officers to attend if at all possible. They have all worked so incessantly for the success of the meeting that they are entitled to the loyal support of the entire membership, and there should be such a rallying of the forces on this occasion as to mark the 1923 meeting one of the greatest ever held in the history of dentistry.

OUR DISTINGUISHED GUESTS

The general session program for the Cleveland meeting, together with the official call and a complete roll of the House of Delegates will appear in the August issue of *The Journal.* Two United States senators, Royal S. Copeland and Henrik Shipstead, have already accepted invitations to present addresses. Hon. Newton D. Baker, former Secretary of War of the United States, will be the honored guest at the general session on Thursday evening, September 13, at Keith's Palace Theatre. Other distinguished statesmen, surgeons and research men will be announced in the general session program.

IN MEMORIAM

Alice B. Connett-Hayes

Alice B. Connett-Hayes, who died at her home in Guymon, Oklahoma, May 16, 1923, was born in Fort Wayne, Indiana, March 8, 1878. Dr. Hayes was graduated from the Indiana Dental College in 1902 and practiced dentistry in Fort Wayne, Indiana and Guymon, Oklahoma.

Medical and Dental News

CONNECTICUT

Dental Hygiene in Bridgeport, Connecticut, Schools: Since June, 1921, Bridgeport has enforced a physical education program which requires several health standards for promotion and as one of these dental requirements has been applied as a passing requisite from grade five to grade six, since the major part of the dental hygiene work is done in the first five grades. The promotional requirement has been (1) a clean mouth; (2) a satisfactory demonstration of home care of the mouth, and (3) no unfilled cavities in the permanent teeth. Last fall practically 100 per cent of the children passed from grade five to grade six with sound permanent teeth and clean mouths.

The Bridgeport school records indicate that the condition of a child's teeth has much to do with his progress in school.

Bridgeport now spends less than any other city of its size for the schooling of children who are compelled to repeat their grades.—(Phila. North American, May 17, 1923.)—Weekly News, Summary, U. S. Dept. of Labor, Children's Bureau.—Dental Hygiene News Letter No. 30.

GEORGIA

Dentists Honor Dr. R. B. Adair as Local Nester.—By J. B. Wight, Jr.: Dr. R. B. Adair was honor guest at a dinner Tuesday evening at the Capital City club when seventy members of the fifth district Georgia Dental association celebrated Dr. Adair's fifty-fifth year in the dental profession.

Dr. T. P. Hinman was toastmaster for the occasion. The principal speakers were Dr. Rambo, of Marietta, and Dr. S. W. Foster, of Atlanta. Following the main speeches, several of the members made a few voluntary remarks concerning the career of Dr. Adair.

During the evening Dr. Adair displayed to the society instruments which he made sixty-three years ago, when dentistry as a science was in its infancy. At the close of the banquet Dr. Adair was presented with a silver pitcher and a half dozen silver goblets, the gift of the Fifth District Georgia Dental Association.—The Constitution, Atlanta, Ga., Thursday, May 17, 1923.

MARYLAND

Certificate issuance in 1922: A total of 11,828 labor permits were issued to children in Maryland during 1922 by the Bureau of Labor and Statistics. This is an increase of 15 per cent over the number issued in 1921. Nearly 500 children were refused permits. Of this number 133 were below the required grade in school; 30 sought work at forbidden occupations; 51 wanted to work during forbidden hours; and 276 were under age.

During 1922, 4,105 children who had not previously been examined by the bureau were given physical examinations. Of this number 718 had physical defects that needed correction; 75 per cent of these children had the needed corrections made and the remaining 25 per cent were granted temporary permits. The examiners withhold permits for unsuitable occupations, and direct applicants to occupations that are not harmful.

Under a provision enacted by the 1922 legislature the period of vocational probation for children who, because of inability to progress in school, are given work certificates when below the age established by law for the certification of normal children, is extended to the age of 18. About 1,500 boys and girls have been made the basis of a study of vocational probation for handicapped youth, the data of which will soon be

published.—Annual Report of the Commissioner of Labor and Statistics of Maryland, 1922.

MINNESOTA

A Six-weeks' Course in Maternity and Infant Hygiene is to be given this summer, beginning June 26, by the Department of Preventive Medicine of the University of Minnesota, Minneapolis. Cooperating with the university in the undertaking are the division of child hygiene of the State Board of Health and the Infant Welfare Society and the Visiting Nurse Association of Minneapolis.—Public Health Nurse, Cleveland, March, 1923.

NEW YORK

"Fifty Years of Child Welfare": By Lillian D. Wald. The author discusses the subject as it is illustrated in three books: "Dangerous Classes," by Charles Loring Brace, 1872; "How the Other Half Lives," by Jacob A. Riis, 1890; and "The House on Henry Street," by Miss Wald, herself, 1915. These books were selected by the president of the Fiftieth Anniversary National Conference of Social Work as marking distinct eras in the consciousness of social relationship in America. The present article is limited to a consideration of the condition of children and the social convictions concerning them, as reflected in the philosophy, institutions, and legislation of the times.—Survey, New York, May 1, 1923.

High School Students Appreciate Dental Hygiene Department: Girls' High School, Brooklyn, N. Y., Jan. 25, 1923.

Dear Miss Wollaston:

It is my sincere pleasure to announce to you that our class on graduating, wishes to leave behind it as a gift, one hundred dollars for the Hygiene Department to use in maintaining the dental clinic in the school. We made the choice in spending our money, because of the real gratitude we feel toward the Hygiene Department.

Undoubtedly it was your vigilance in keeping after our dental welfare that has helped us along the road to graduation, for good teeth make good health, and good health makes good minds, and good minds make graduation possible. This is perhaps inelegant language but it is plain fact.

Besides this benefit, we have gained another. You have succeeded in establishing in us that habit of regular dental attention. After knowing the pleasure of clean healthy mouths for four years, we want them all the time (even in spite of the fact that dentists are regular Spanish Inquisitionists.)

With the help of our gift, may your good work be carried on.

Thanking you,
I remain,
Very sincerely,
(Signed) Nolda M. Warmoltz,
President of Class of February, 1923.

OHIO

Physician Sentenced: Dr. Addison D. Hobart, Toledo, reports state, was sentenced to serve three years in the Atlanta penitentiary by Judge Killits in the federal court, March 5, when he was found guilty of violating the Harrison Narcotic Law.—Journal American Medical Association, March 17, 1923.

Poor teeth of public school children: The medical examination of 4,500 public school children of Cleveland who had applied for working permits showed that the teeth of practically all the applicants were in poor condition. The Chamber of Commerce has appointed a committee on mouth hygiene to report dental needs among school children and to suggest a remedy for the conditions found. The city now has eight dental clinics which take care of the teeth of about 19 per cent of the first grade children. It is hoped that eventually it will be possible to have one clinic for every four schools.—Journal American Medical Association, Chicago, April 21, 1923.

OREGON

The bill authorizing school boards of the State to provide free dental inspection in the schools and clinics for free dental treatment of children whose parents are unable to pay for it failed of passage in the recent session of the legislature, but a substitute measure applying only to Portland was passed. That city is to have four free clinics this year, one maintained by the city, one by the Red Cross, and two by local civic organizations.

During the school year 1921-22, the school dental clinics in Portland examined almost 30,000 pupils, over 80 per cent of whom were found to have defective teeth. Through treatment the general health of the children was much improved, absences from school were lessened, and the number of children who failed of promotion was reduced.—American City, N. Y. City, June, 1923.

VERMONT

Vermont has enacted a law (H-194), signed by the Governor February 19, reorganizing the civil administration of the State government. Among the departments created are a department of public welfare, administered by a commissioner and an assistant commissioner; a department of public health, administered by the State board of health as at present constituted and a department of education, administered by the State board of education and in which is to be a commissioner of education. The board of control, board of charities and probation, and the offices of State probation officer and director of State institutions are abolished.

The department of public welfare is to exercise the rights, powers, and duties now vested in the director of State institutions, the board of charities and probation, and the State probation officer. The commissioner of public welfare is to be the State probation officer. The department is also to exercise the duties now exercised by the Governor as commissioner of the deaf, dumb, blind, idiotic, feebleminded, or epileptic children of indigent parents, and as commissioner of indigent tuberculosis persons, and the duties of the board of trustees of the Vermont Sanatorium, the State board of supervisors of the insane, and the trustees of tuberculosis hospitals.

WEST VIRGINIA

A county-wide free dental clinic, supported by the county on the same basis as the public schools, has been maintained in McDowell County for the past seven years. Every child in the county has his teeth examined once each year and receives any needed treatment. Any defects of the throat, ears, or nose discovered by the dentists are reported to the parents with the recommendation that treatment be sought. A school which has a dental score of 100 per cent gets a half-holiday—a reward which has proved effective, rebellious children being in some instances persuaded by their friends to submit to the ordeal of treatment in order to secure the perfect score for the school.

The effect of sound teeth and healthy mouths upon school work is marked. Retardation in the schools of the county is greatly reduced. In one school of 250 pupils not a single pupil has failed to make his grade in the past six years, and a considerable number have advanced one or two grades beyond those normal for their age.—Survey, N. Y., May 15, 1923.

WISCONSIN

The repeal of the Wisconsin eugenic marriage law has been voted by both houses of the state legislature, on the ground that the law has proved ineffective.—Washington Post, April 19, 1923.

The Maternity and Infancy Act has been accepted by the legislature of Wisconsin, which is the thirty-sixth state to accept the provisions of the law through legislative action. Legislation is still pending in seven other states.

GENERAL

"Peril of Bad Teeth": According to the Daily Express, "startling evidence of the peril of the dead tooth," to which this paper claims to have first drawn attention, was afforded by the death of Walter Mead Sharman, aged 56, of St. John's Wood Terrace. While riding on the top of an omnibus Sharman was suddenly taken ill and soon died. At the inquest, a doctor who made a post-mortem examination stated that Sharman's death was caused by degenerative disease of the heart and arteries. He added that the condition could have been induced by pyorrhea, from which so many people suffered. The coroner, Mr. H. R. Oswald, addressing the widow remarked: "It is quite possible that owing to neglect of his teeth, physical changes were brought about which led to your husband's death."—The Dental Surgeon, Vol. XX, No. 965, page 268.

"Minimum Standards of Prenatal Care" is the title of a seven-page folder just issued by the Children's Bureau, setting forth concisely "the least a mother should do to prepare for her baby's birth."—Folder No. 1, Children's Bureau, U. S. Dept. of Labor.

"The Pre-School Child, from the Standpoint of Public Hygiene and Education.": By Arnold Gesell, Ph.D., M.D., Director of the Yale Psycho-Clinic and Professor of Child Hygiene, Yale University, Houghton Mifflin Company, 1923.

This volume is one of the series of Riverside Textbooks in Education. In his introduction the editor states that the book should be of special interest to school administrators and students of child hygiene, and to those interested in the work of health centers and infant-welfare movements.

Health education scholarships: The American Child Health Association announces a new series of fellowships and

scholarships to be awarded to teachers in service for training in health education. The sum of $10,000 has been allotted to the series. The awards will include five fellowships of not more than $1,000 each and five scholarships of not more than $500 each. The remainder of the sum will be used for traveling expenses and summer school scholarships for teachers in rural districts who are not normal graduates, but who are doing good work in health education in their respective communities. The basis of award will take into consideration the past achievements of the applicant in health education, her plans for health education in the future, and documentary evidence of the value of her work from educational authorities in her community. The teachers will be assigned to carefully selected institutions which meet the requirements of the committee. The scholarships will go into effect the coming summer and fall. Applications should be made to Dr. Thomas Wood, American Child Health Assn., 370 Seventh Ave., N. Y. City.—Mother and Child, Washington, D. C., May, 1923.

The 1923 Annual Meeting of the American Child Health Association will be held in Detroit, October 15-17. The Child Welfare Section of the National Organization for Public Health Nursing will meet with the Association. Immediately following these sessions the Central States' Pediatric Society will hold its annual meeting in Detroit.

Abrams Method of Diagnosis is a Fraud: At a largely attended regular meeting of the Medical Society of Milwaukee County, held May 10, Dr. G. E. Seaman offered the following motion:

"That the entire Abrams method is such a palpable fraud that this Society considers it beneath its dignity to appoint a Committee to investigate it, and that the pursuit of the Abrams method on the part of any member of this Society shall be considered inconsistent with membership in this society."

The motion was carried without a dissenting vote. Two or three weeks ago, The Journal published a resolution printed in the Bulletin of the Los Angeles County Medical Association, in which that society went on record as declaring that the "Abrams method of diagnosis is a fraud" and that any physician who practiced the method was ineligible to membership in the association, and that any member of the association who practiced the method would have charges of unethical conduct preferred against him. As a result of this editorial note we have received a brief letter from Dr. W. B. Moore, the secretary of the Harrison County (Kentucky) Medical Society, reading in part:

"I wish to state that the Harrison County Medical Society expelled two of its members March 5 for practicing this fraud. This is the first instance I have noticed of a doctor being expelled from his society for such unethical conduct."

In this connection, it may be of interest to recall the fact that last January the Tulsa County (Oklahoma) Medical Society expelled two of its members who were local exponents of the Abrams methods. More than a year and a half ago the Massachusetts Medical Society called for the resignation of one of its members who was an Abramsite, and about a year ago the same individual had his license to practice medicine revoked by the Massachusetts Board of Registration in Medicine on the charge that he was guilty of deceit, malpractice and gross misconduct in the practice of his profession in that he had treated a young man by the so-called Abrams method.—Journal of the American Medical Association, May 19, 1923.

Toothless Men: Mr. K. J. Thadain, of the Agricultural Department, Bombay, in writing to the Journal of Heredity, states: "There occurs in the Hindu Aniel Community of Hyderbad Sind, a town in India, a type of men who have no teeth. These men are further characterized by bald heads and an extreme sensitiveness to heat. They are known as 'Bhudas,' which literally means 'toothless.' The following facts are known about them:

1. When such a man (a 'Bhuda') marries a normal girl having both parents free from these defects, all the children, both males and females, are apparently normal—that is to say, apparently free from the defect.

2. When the males marry normal females, having both parents normal, their children both males and females are apparently normal.

3. When the females marry normal males, their female children are apparently normal, while the male children are 'Bhudas.'

4. No case is known in which a toothless man has married the daughter of a 'Bhuda.'

5. No females have been found showing the anodont condition."

This is, apparently, a case of sex-

linked inheritance in man. The inheritance of this toothless condition, as well as the association defects of sensitivity and hairlessness, is a case in point, and the causative character seems to be carried by the sex chromosomes.—The Dental Surgeon, March 31, 1923.

"Physical perfection is a priceless possession. It is only when we lose an important member or see a defective human being that we realize the value of sound, complete bodies. Mrs. Wiggs of the Cabbage Patch was evidently observing as well as philosophical. "Jest remembering that I haven't got a harelip keeps me happy all day," she said in one of her optimistic moments. Physical imperfection is a terrible handicap and the person with a physical defect who is able to conquer his disability, is entitled to all the greater credit.—"Health," Vol. III, No. 1.

"Nutrition of Mother and Child." By C. Ulysses Moore, M.D., M.Sc. (Ped.), Instructor in Disease of Children, University of Oregon Medical School. Including menus and recipes by Myrtle Josephine Ferguson, B.S., B.S., in H. Ec., Professor of Nutrition, Iowa State College, Ames, Iowa. Published by J. B. Lippincott Co., 1923.

As the foreword states, this is a "textbook for young mothers, and for social workers and nurses who have to advise them."

We Can Live Ten Years Longer: The world has many discoverers. It sins greatly in not using their discoveries. The way of progress is for each community, each nation, to learn about the best that has been done anywhere else in the world and sieze upon it. "The average life in America could be lengthened ten years," said Dr. Augustus S. Knight, medical director of the Metropolitan Life Insurance Campany, recently, "if present medical and sanitary knowledge were utilized through the establishment here of conditions equal to the best now existing in various parts of the world." He also said: "Nineteen twenty-two has been another remarkable year in public-health history. The figures for the first ten months show a death rate just about as good as the unsurpassed record of 1921.

But why should any year be worse than the one that preceded it? On the graph of human welfare the curve of progress should be forever upward. — Colliers Weekly.

When the well is dry we know the worth of water, and when the pocket is empty we know the value of money. The happy-go-lucky individual who spends as much as he makes is a thin-ice skater. If sickness or loss of work should come, he drops through and disappears. When old age descends upon him, it is unfortunate but true, that he usually finds himself in the threadbare ranks of those who have seen better days. Times have changed materially since Benjamin Franklin wrote these words about the well, but the lesson they impart is as unchanging as the stars. Those who practice thrift, who prepare for next year as well as this, go rapidly forward. A steady-growing bank account gives them confidence to branch out and courage to tackle bigger things. It makes the step lighter and the heart more cheery.—C. P. C. Pacemaker.

"The Well Child and How to Keep Him So" was the theme of Dr. Carolyn Hedger during the health and nutrition campaign conducted in October in 15 counties in the state, with the co-operation of farm bureaus, Red Cross chapters, county superintendents, and women's clubs. Forty demonstrations were conducted, which were attended by about 9,000 people. Parents' score cards were used in teaching standards of health for the growing child, and were adopted for further use in many homes.—Jour. of Home Economics, Baltimore, January, 1923.

Inheritance of Cleft Palate: In the Journal of Anatomy for January, R. J. Gladstone and C. P. G. Wakely review the question of inheritance of congenital defects, especially with reference to defects of the palate and lip. There is a very popular idea supported by most of the textbooks that cleft palate and harelip are often hereditary. The authors do not find that the evidence supports this view and they consider that these and other antenatal deformities are rarely inherited directly. Out of 554 cases of harelip and cleft palate, they found only two cases in which the deformity was present in one of the parents. They agree with the conclusions arrived at by J. Arthur Thompson that the persistence of a transient stage of development such as harelip, cleft palate or spina bifida is due to inadequacy of nutrition or deficient developmental vigor. In those cases in which there is a history of inherited abnormalities it is the deficiency in which there is a history of inherited rather than the particular defect. This may be accentuated by nutritive defects on the part of the mother during gestation which may de-

termine the appearance of a defect in the offspring.—The British Dental Journal, February 1, 1923.

An investigation to determine how the individual child grows in mind and body has been undertaken by the Harvard Graduate School of Education, with the co-operation of public and private schools in the vicinity. It is planned to take several hundred children and submit them to physical measurements and mental tests at intervals during a period of 12 years, probably between the ages of 6 and 18. It is hoped that the inquiry will furnish a new basis of facts for the discussion of educational problems.—Washington Star, February 9, 1923.

The Value of Pain: Of all the varied symptoms by which disease makes its presence felt, none is more noticeable to the patient than pain. Most other symptoms he can neglect, or deeming them unimportant, pay them scant attention. Pain, however, forces itself upon his notice, and the desire to obtain relief drives him to seek advice. Thus pain is a valuable asset, albeit a distinctly unpleasant one. It is a warning that something is wrong; moreover, it is a warning, which by virtue of its very nature is extremely difficult to disregard.

Thus, those diseases in which pain is a prominent symptom are generally treated in the early stages: when this symptom is absent, treatment is often long delayed.

This point is well brought out by a consideration of such a condition as carcinoma in the mouth. Frequently quite painless, oral carcinoma often remains quite unnoticed by the patient until the time for successful treatment is passed.

Another and far more widespread disease in which the absence of pain frequently leads to delay in seeking advice is our old enemy, pyorrhea alveolaris. In his lecture, delivered under the auspices of the Dental Board, and recently published in this journal, Mr. J. G. Turner asserts that pain is a more frequent accompaniment of pyorrhea than is generally supposed. Even so, the pain is rarely severe, and many patients prefer to put up with the slight discomfort rather than risk the opportunity of dental treatment, which they dread.

Thus, the golden opportunity which early diagnosis and early treatment affords is lost.

The presence of pain is also of value in enabling the dentist to induce his patient to submit to necessary treatment. How often have we heard the remark, "There can't be much wrong, as I haven't felt any pain."—The Dental Surgeon, May 12, 1923.

DENTAL CORPS ORDERS FROM WAR DEPARTMENT

Army: Captain William C. Webb, Jr., from duty at Army dental school, Walter Reed General Hospital, D. C., about June 15 to West Point, N. Y., Military Academy for duty.

The following from duty at Army dental school, Walter Reed General Hospital, D. C., about June 15 to stations indicated for duty: Captains Lawrence K. Anderson, Jefferson Barracks, Mo.; Boyd L. Smith, Jefferson Barracks, Mo.; James B. Harrington, Fort Sill, Okla.; James J. Weeks, Fort Oglethorpe, Ga.; James L. Olsen, Fort Benning, Ga.; Daniel S. Lockwood, tank center, Camp Meads, Md.; Thomas F. Davis, Fort Bragg, N. C.; Clarence W. Johnson, Fort Des Moines, Iowa; Hugh J. Ryan, Fort Riley, Kans.; Arthur E. Brown, Fort Humphreys, Va.; Arthur B. McCormick, Fort Niagara, N. Y.—Army and Navy Register, May 12, 1923.

Army: Colonel Franklin F. Wing from duty at Fort Sam Houston, Tex., to Washington and report June 15 at Walter Reed General Hospital for duty as commandant Army dental school and chief of dental clinic.

Lieutenant Colonel Julien R. Bernheim from duty at Letterman General Hospital, San Francisco, to Fort Sam Houston, Tex., for duty.

Lieutenant Colonel George D. Graham from duty at headquarters, nondivisional group, Organized Reserves, 3d corps area, Harrisburg, Pa., and from duty with Organized Reserves, 3d corps area, to New York City and about July 25 via transport to San Francisco and report at Letterman General Hospital for duty.

Captain George R. Kennebeck from duty at Chanute Field, Ill., to Washington, Army medical school, about June 1, for duty.

Captain Jerome L. Fritsche from duty at Scott Field, Ill., to Chanute Field, Ill., about May 20 for duty.—Army and Navy Register, May 26, 1923.

FOREIGN

"Rural Welfare Work of Mexican Government." By Helen Bowyer, Mexico City.

An account of the traveling exhibit of the Mexican Department of Agriculture,

which has entered upon an itinerary through the rural communities of the country, using two railroad cars granted by the government for the purpose. The exhibit includes posters on hygiene, food values, housing, child care, cleanliness, and the importance of education. A feature received with great enthusiasm by the younger members of the communities visited is the playground which is set up wherever the exhibit is shown.—Nation's Health, Chicago, February 15, 1923.

A group of forty children from the Bakule School for Crippled Children in Prague, Czechoslovakia, is soon coming to make a two-months' tour of the United States, through arrangements made by the American Red Cross. This school was founded by Dr. Bakule with the aid of the Junior American Red Cross for the training of children crippled and made helpless by the war, and through its successful work in reconstruction has become of international importance. The children will give demonstrations to show what can be done in the training of cripples.—Red Cross Courier, February 10, 1923.

A floating health propaganda unit installed on a river steamboat by the Polish-American Committee for Child Relief, Warsaw, recently journeyed down the Vistula, stopping at 43 towns and villages between Cracow and the mouth of the river. Popular lectures on health subjects were given, sometimes on board the boat and sometimes in the towns, either in buildings or in the open air; and the people were urged to make use of the service offered by the committee and by the Red Cross. The audiences totaled nearly 150,000 people, some of whom came from long distances.—The World's Health, Paris, March, 1923.

Cuban Consul writes:—New York, N. Y., May 2, 1923.

To Dr. Otto U. King,
Secretary of the American Dental Association,
5 No. Wabash Ave.,
Chicago, Ill.

Dear Doctor:

In compliance with the wishes of the State Department of the Republic of Cuba and the National Dental Association of Cuba, I wish to convey to you the most cordial thanks for your brilliant work published in "The Dental Digest" regarding the Cuban dentists and especially about Dr. Andrew Weber and Dr. Marcelino Weiss.

The Cuban Government fully appreciates your kind words and the publication of your work.

Believe me, dear Doctor,

Very sincerely yours,
F. Taboada, Consul General.

Wireless Medical Advice: Our exchanges announce that ships of every nationality on the sea may obtain medical advice on request from the two great hospitals in Stockholm. The Swedish government has approved a proposition to broadcast medical advice in the Swedish, English, German and French languages.

Chinese Students in Japan: The Japanese government has planned to assist Chinese students in Japan should China carry out its proposed plan to cease giving financial aid to Chinese students in other countries. There are now 1,179 Chinese students at government schools supported by the Japanese government; of this number, 115 are medical students.—Journal of the American Medical Association, May 5, 1923.

A Feather in the Parotid Duct: Sir James Dundas-Grant reports the following curious, and we think unique, case of obstruction in the parotid duct, in a recent issue of the British Medical Journal:

"Some years ago a small child was referred to me at the Central London Throat and Ear Hospital, on account of inability to open the mouth, and the presence of a large painful swelling, extending backwards and downwards from the right parotid region. The swelling was obviously an abscess on the point of bursting externally. I was able to force the mouth open sufficiently to allow me to see a small white object projecting from the orifice of Steno's duct. I pulled it out and found it to be the tip of a feather, which was about an inch in length. Evacuation of the pus by a simple incision was soon followed by complete recovery. The feather, which had evidently come out of the child's pillow, had been accidentally drawn into the mouth. The stem had entered the parotid duct, and the feather had apparently worked its way inwards in the same fashion as a spike of grass, when put inside the coat sleeve, in the familiar trick of our childhood."—The Dental Surgeon, April 21, 1923.

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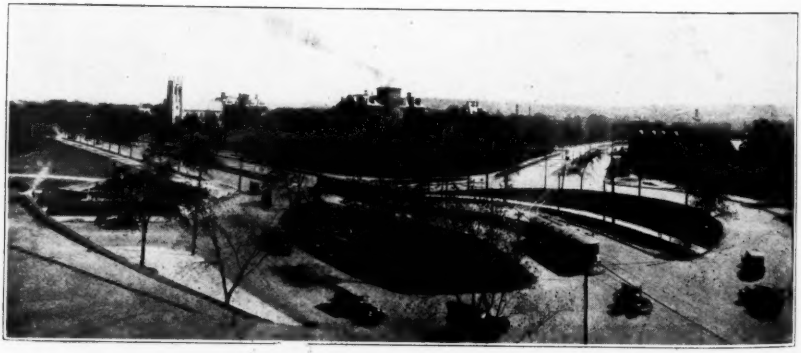


University Circle, Cleveland, Ohio.

PRELIMINARY PROGRAM OF THE SCIENTIFIC SECTIONS

OPERATIVE DENTISTRY, MATERIA MEDICA AND THERAPEUTICS

(Auditorium at Cleveland Hotel. All subsequent meetings held in same place.)

OFFICERS OF SECTION

J. R. Blayney, Chairman .....Chicago, Ill.
E. C. Mills, Vice-Chairman ....Columbus, Ohio
Alfred P. Lee, Secretary ....Philadelphia, Pa.

TUESDAY AFTERNOON, SEPTEMBER 11

2:00 P. M. to 5:00 P. M.

"Children's Teeth with Special Reference to Cavity Preparation and Choice of Filling Materials"

By William H. Leak ....New York, N. Y.

Synopsis—Prevention of decay. Method for parent to use in brushing the child's teeth. How the child should brush the teeth. Warning on the mal-use or mis-use of prophylactic filling materials or of medication. Anatomical differences in permanent and deciduous teeth and their significance in cavity preparations and the choice of filling materials. When to save deciduous non-vital teeth. The importance of careful technic and its appreciation by the parent.

Discussed by

Haidee Weeks Guthrie .....New Orleans, La.
Philip R. Thomas .....Minneapolis, Minn.

"Important Points the General Practitioner Should Know in Order to Prevent Dental Irregularities"

By Mildred W. Dickerson .....Washington, D. C.

Synopsis—A resume of what constitutes dental irregularities. Importance of careful and thorough diagnosis of mouth conditions early in childhood, including a history of inherited tendencies and predispositions of the child, that the more obscure irregularities may not be overlooked. Necessity for the unceasing watchfulness and care by the dentist during the periods of babyhood, childhood and adolescence. Orthodontia when indicated or when contraindicated. A plea for more uniform and simple instructions for home care of children's mouths.

Discussed by

C. N. Johnson .....Chicago, Ill.
Russell W. Bunting ....Ann Arbor, Mich.

WEDNESDAY MORNING, SEPTEMBER 12

9:00 A. M. to 12:00 M.

"The Dentist's Chance of a Lifetime"

By H. L. Rockwood, (M.D.) .....Cleveland, Ohio

Synopsis—Why play a losing game when there is a way to win? The chances for good health and long life today depend more than ever before on how you play the game. Some rules of the game the dentist should know. The physical welfare of the dentist concerns the nation. Factors which conserve human life must themselves be conserved. Community responsibility. Individual responsibility. When in doubt play trumps. What are the trump cards in playing for health?

Discussed by

Thomas P. Hinman .....Atlanta, Ga.

"Gold Foil"

By Edmund Noyes .....Chicago, Ill.

Synopsis—The paper will give a brief account of the use of gold foil in dentistry, of noncohesive and cohesive gold, and the work of Dr. G. V. Black on that subject. The prevalence of imperfect operations as related to the widespread acceptance of the "New Departure" theories. Something about instruments and technic, also the relative uses for foil fillings and gold inlays.

Discussed by

W. R. Clack .....Mason City, Iowa.
Willis A. Coston .....Topeka, Kansas.

"Technic for Making Cast Gold Inlays"

By Victor T. Nylander .....Chicago, Ill.

Synopsis—A. Finishing of cavity preparation. Cavity protection. Waxes, wax pattern. B. Contour and contact. C. Investment. Spatulation, application and setting. D. Dissipation of wax, rapid and slow method, temperature range. E. Blowpipes and casting: Oxygen gas; oxygen and hydrogen; hydrogen and air; hydrogen, gas and air. F. Golds. G. Finishing. H. Setting.

Discussed by

Alden J. Bush .....Columbus, Ohio
Robert O. Green .....St. Paul, Minn.

WEDNESDAY AFTERNOON, SEPTEMBER 12

2:00 P. M. to 5:00 P. M.

"The Utility of Radiography in Operative Dentistry with Special Application to Preventive Service"
By Clarence O. Simpson ....St. Louis, Mo.

Synopsis—Adequate standards, and how they are attained. The advantages of vigilance and early diagnosis. The value of routine radiodontic examinations. Indications in secondary dentition. The detection of incipient caries and periodontal lesions. Radiographic assistance in restorative procedures. Radiographic service in pulpless teeth. Refinement and judgment in the interpretation of radiographic evidence.

Hotel Cleveland.

Discussed by
C. Edmund Kells .....New Orleans, La.
Howard R. Raper .....Albuquerque, New Mex.

"The Value of Antiseptics in the Root-canal Filling"
By Arthur B. Crane ....Washington, D. C.

Synopsis—The natural defensive processes indicate the rationality of root-canal work. Present diagnostic methods are unreliable in periapical disease. The restoration of the periapical norm is attainable in certain cases of periapical disease; and by every standard of pathology this is evidence of cure. The total obliteration of the pulp channels is impossible by any present technic but such obliteration is not necessary.

Discussed by
Carl J. Grove .....St. Paul, Minn.
H. D. Grubb .....Cleveland, Ohio

THURSDAY MORNING, SEPTEMBER 13

9:00 A. M. to 12:00 M.

"A Consideration of the Effects of Trauma Upon the Periodontal Tissues Produced by Indifferently Executed Restorations"
By Frederick A. Bricker .....Rochester, Minn.

Synopsis—How trauma is caused through the use of hard gold having greater resistance to wear than the tooth structure. Objections to the use of wax and carbon paper in correcting occlusion. Direction of stress during mastication and while the jaws are at rest or in centric occlusion. Method of diagnosing and correcting traumatic occlusion.

Discussed by
Frank H. Skinner .....Chicago, Ill.
George R. Ellis .....Washington, D. C.

"Periodontal Diseases and Their Treatment from the Viewpoint of Operative Dentistry"
By F. W. Merrifield .....Chicago, Ill.

Synopsis—Review of the structures composing the investing tissues of the teeth, their histology, physical functions and the possibilities of their recuperation following disease or accident. The importance of correct operative procedures, not only as to prevention, but also palliative measures and cure will be emphasized. A conservative outline for the general practitioner rather than the specialist.

Discussed by
John F. Biddle .....Pittsburgh, Pa.
J. H. Phillips .....Nashville, Tenn.

FULL DENTURE PROSTHESIS

(Rainbow Room, Winton Hotel. All subsequent meetings will be held in the same place.)

OFFICERS OF SECTION

H. B. Washburn, Chairman ....St. Paul, Minn.
I. L. Furnas, Vice-Chairman .....Cleveland, Ohio
Victor H. Sears, Secretary .....Salt Lake City, Utah

TUESDAY AFTERNOON, SEPTEMBER 11

2:00 P. M. to 5:00 P. M.

(This section program is arranged with the thought that consideration of a subject should begin with fundamentals and proceed from that point in logical sequence. Subjects were selected and then the essayists invited who were qualified to present the subject.)

Interior View Cleveland Public Auditorium.

"Regional Anatomy, Emphasizing Mandibular Movements with Specific Reference to Full Denture Construction"

By H. J. Prentiss .....Iowa City, Ia.

Synopsis—(1) A general consideration of the mandible and maxilla from birth to adult life in human type. (2) Comparison with lower forms. (3) Presence of external pterygoid plate in human type. Its absence in lower forms. (4) Accentuation of eminentia articularis in human type. (5) Digastricus in lower types. Modifications in human type. (6) Spheno-meniscus muscle in humans and lower types. (7) External pterygoid in human type. Absence in lower types. (8) Reasons for presence of meniscus in all types. (9) Its peculiar significance in human types. (10) Action of internal pterygoids. Action of spheno-meniscus. Action of external pterygoid in human. (11) Destruction of menis-cus in human following loss of teeth. (12) Possible compromise in adjustments of plates. Possible complications. (13) Mechanism of mandibular ligaments in human type. (14) Summary.

Discussed by

W. H. Wright .....Pittsburgh, Pa.

"Mechanics of Denture Construction"

By I. M. Hair .....Atlanta, Ga.

Synopsis—The mechanics of full denture construction consists of five points of consideration, and includes the factors of retention, balance, condyle relation to glenoid fossae, and vulcanization.

1. Contour and form of the arch in relation to retention factors: (a) Adhesion. (b) Cohesion. (c) Atmospheric pressure. (d) Outline of denture to points of muscle attachments and soft tissue. Ople's Law of Gases. (e) Reliefs for median line, etc.

2. Registration of Central Occlusion: (a) Condyles in glenoid fossae. (b) Pressure equalization. (c) Freedom of tongue and lips.

3. Position of Teeth on Ridge: A. Leverage. (1) Fulcrum Point. (a) Normal thickness of mucosa. 1. Creat of ridge if relieved, otherwise median raphe of palate. (b) Soft, flabby ridge. (a) Junction of hard and soft area. (b) Materials. (1) Artificial stone. (a) Proper consistency. (b) Method of packing the stone. (c) Requirements of a stone. Non-expanding, non-disintegrating in vulcanizer. (2) Gold or Vulcanite. (c) Removing wax. (d) Waste grooves. (e) Packing. (f) Testing. (1) Proper excess. (g) Pressed. (h) Vulcanization. (1) Temperature. (2) Steam vulcanizing. (i) Opening and cleaning cases and trimming cases. (j) Finishing and polishing. (k) Remounting. (b) Tongue Space. (1) Should not crowd tongue lingually. C. Relation to cheek tissues. (1) Teeth should not be too far buccally because of leverage; because of destroying face form and causing cheek biting.

Garfield Monument.

4. Cusp Co-ordination or articulation. (1) Central Occlusion. (2) Working Occlusion. (3) Balancing Occlusion. (4) Incising Occlusion. (a) Prevents rotation and tripping which is followed by irritation and absorption.

5. Investing, packing, vulcanizing and finishing case. (a) Flask type. (1) Milled edges for accuracy in closing. (2) Pressure Type. (a) Allows expansion of vulcanite without distortion.

Discussed by
W. F. Lasby .....Minneapolis, Minn.
Edwin H. Mauk .....San Francisco, Cal.

WEDNESDAY MORNING, SEPTEMBER 12

9:00 A. M. to 12:00 M.

"The Fundamental and Basic Principles of Mouth Classification"

By M. M. House .....Kansas City, Mo.

This will cover the same, beginning with biological development and showing the true conditions as applied to edentulous conditions due to modifications caused by surgical interference and absorptions. It will also show some of the principles of applied physics and art.

Discussed by
Geo. P. Brenner .....Milwaukee, Wis.
R. O. Schlosser .....Chicago, Ill.

"History and Evolution of Occlusion"

By H. B. Washburn .....St. Paul, Minn.

Synopsis—For the purpose of better presentation we have specified three periods. First, primitive dentistry. (This includes everything before Bonwill's time.) Second, Bonwill Era (1850-1890). Third, Renaissance period of dentistry. (Beginning in 1890 with Walker presenting a new idea which has influenced all theories on occlusion since.) We shall attempt, by setting down in sequence the high lights in the history of this subject, to demonstrate that present day theorems on occlusion are a natural evolution.

Discussed by
Wm. A. Giffen .....Detroit, Mich.
O. DeForest Davis .....Minneapolis, Minn.

WEDNESDAY AFTERNOON, SEPTEMBER 12

2:00 P. M. to 5:00 P. M.

"Esthetics"

By J. W. Crawford .... Milwaukee, Wis.

Synopsis—The anatomical relation of the muscles of mastication and expression, the relationship of the mandible to the maxilla and

the position of the condyles in the glenoid fossa as a basis for esthetics in full dentures.

Discussed by
R. G. Keyworth .....St. Paul, Minn.
P. C. Lowery .....Detroit, Mich.

"The Masticatory Mechanism Considered in its Relation to the Chemistry and Mechanics of Digestion"
By Thomas B. Hartzell .....
.....Minneapolis, Minn.

Synopsis—I will treat briefly the development and use of the natural teeth as they af-

Soldiers and Sailors Monument.

fect the bones of the jaw itself, and the bony structure of the base of the skull; the effect of mastication in developing the strong lines in the support of the teeth; the effect of mastication in developing the salivary glands; the relation of salivary digestion to the stomach and intestinal digestion; the value of correct and efficient mastication in its relation to the digestion of foods and finally a consideration of the artificial denture in restoring natural and efficient mastication and a consideration of advantages that arise from the replacement of efficient masticating apparatus by imperfect artificial dentures as compared to the more perfect modern type of denture now being evolved by the prosthetist.

Discussed by
Wallace Seccombe .....Toronto, Canada
Thomas P. Hinman .....Atlanta, Ga.

"Bacterial Growths on Artificial Dentures"
By W. J. Pryor .....Cleveland, Ohio

Synopsis—1. A review of work done by men before me on the inhibitory action upon bacterial growths of various materials that may be used in the construction of artificial dentures. 2. A report of the work done in this field by the essayist. 3. Suggestions that may be helpful to those who would construct dentures that will tolerate the mouth tissues with the least amount of irritation.

Discussed by
Ira G. Nichols .....Chicago, Ill.

THURSDAY MORNING, SEPTEMBER 13

9:00 A. M. to 12:00 M.

"Case Histories"
By Geo. S. Monson .....St. Paul, Minn.

Synopsis—1. The history of four cases that occur in general practice which would be the same as many others that confront us. 2. The placing of the mandible in a correct relation to the other bones by its muscular balance. 3. The unrolling of facts that were not anticipated in each case. 4. The results in general health in each of the cases.

Discussed by
Frank H. Skinner .....Chicago, Ill.
William Denton Taylor.....Newark, N. J.

"Cusp Trauma"
By Felix A. French .... Ottawa, Canada

Synopsis—1. Its vital importance in full denture construction. 2. Cusp trauma as a cause of tissue atrophy. 3. Difference between cusp trauma in natural and artificial dentition. 4. Factors governing cusp form and arrangement. 5. Relation between cusp form and ridge form.

Discussed by
Rupert E. Hall .....Chicago, Ill.
F. M. Hight .....Houston, Texas

"The Dentist's Duty to His Edentulous Patients"
By Robert H. Gillis .....Hammond, Ind.

Synopsis—His preliminary training, mental and technical; The patient's dire need; Case analysis and diagnosis; Prognosis and education of the patient; Demonstration of technical ability; Co-operation essential; Analysis of result; Summary.

Discussed by
Victor H. Sears ....Salt Lake City, Utah
J. B. La Due .....Chicago, Ill.

PARTIAL DENTURE PROSTHESIS*

(Main Ballroom, Winton Hotel. All subsequent meetings held in same place.)

OFFICERS OF SECTION

Theodore W. Maves, Chairman .....Minneapolis, Minn.

Willis A Coston, Vice-Chairman .....Topeka, Kansas

O. DeForest Davis, Secretary .....Minneapolis, Minn.

TUESDAY AFTERNOON, SEPTEMBER 11

2:00 P. M. to 5:00 P. M.

"Balanced Occlusion and Its Relation to Partial Denture Construction"

By J. W. Needles .....Pueblo, Colorado.

Synopsis—1. Definition. 2. Distinction from traumatic occlusion. 3. Fundamental to all branches of dentistry. 4. Ideals of normal occlusion. 5. Mechanism of maxillomandibular joint. 6. Distribution of the forces of mastication. 7. Relation of cusp depth and overbite to curve of Spee. 8. The Spherical theory. (a) Opening closing axis. (b) Varying axes of lateral and protrusive movement. (c) "Rotation Center." (d) Components of movement at condyle and incisal point. (e) Development of maxillary apparatus. (f) Spherical theory predicts results of new conditions. (g) Spherical theory as a foundation for accurate technic. (h) Central occlusion. (i) Range of occlusion. (j) Restoration of ideal conditions. (k) Choosing new central occlusion. l. Degree of accuracy necessary. 9. Therapeutics. (a) Do we wish to conform to existing conditions? (b) Do we wish to modify for mechanical or therapeutic reasons? (c) Do we wish to modify to establish ideal relations?

WEDNESDAY MORNING, SEPTEMBER 12

9:00 A. M. to 12:00 M.

"Conditions Affecting the Solution of the Esthetic Problem in Fixed Bridgework"

By Forrest H. Orton .....St. Paul, Minn.

Synopsis—1. Differentiation in the esthetic requirement of the various types of partial denture restoration. 2. Differentiation in the esthetic requirements of the upper and lower teeth. 3. Characteristics of remaining natural teeth: (a) Anatomy. (b) Pathological scars, Abrasion, Erosion. (c) Age, Checks, Stain. (d) Alignment, etc. 4. Methods of studying line employed in art schools: (a) Color considerations natural teeth: (What each tissue contributes: Enamel, dentin.) Effect of environment: Lips, oral cavity, reflection. 5. Comments on flat back teeth furnished by the manufacturer with recommendations. 6. Conclusion, with suggestions in teaching technic of matching natural teeth.

"The Reasons for, and a Technic for, Obtaining Balanced Occlusion in Fixed Reconstruction"

By C. K. Bird .....St. Paul, Minn.

Synopsis—This paper will feature some of the fundamental factors in fixed reconstruction. What balanced occlusion is, why necessary, and with the aid of slides attempt to show a method for restoring balanced occlusion in mutilated arches.

WEDNESDAY AFTERNOON, SEPTEMBER 12

2:00 P. M. to 5:00 P. M.

"Preparations Indicated on the Various Types of Teeth for Bridge Abutments, Preserving Vitality"

By Theo. W. Maves ....Minneapolis, Minn.

"Removable Bridgework"

By B. B. McCollum .....Los Angeles, Cal.

THURSDAY MORNING, SEPTEMBER 13

9 A. M. to 12 M.

"The Cast Gold Abutment in Combination With a Porcelain Jacket Crown in Bridge Restorations"

By J. E. Argue .....Seattle, Wash.

Synopsis—It will consist of an illustrated paper, describing and illustrating the different steps in the technic of the operation, also illustrations showing completed cases demonstrating the highly artistic result that can be obtained in the mouth.

"Fixed Bridgework"

By Emory C. Thompson .....Warren, Pa.

Synopsis—Problems and important factors involved in manipulation of wax, investing process, carbonization and elimination of wax in the burning-out process, casting and a few fundamentals pertaining to metallurgy.

*The clinic for this section is listed in the Clinic Program under Partial Denture Section.

ORAL SURGERY, EXODONTIA AND ANESTHESIA

(Ballroom, Hollenden Hotel. All subsequent meetings held in same place.)

OFFICERS OF SECTION

J. P. Henahan, Chairman .....Cleveland, Ohio
Boyd S. Gardner, Vice-Chairman .....
.....Rochester, Minn.
Frederick F. Molt, Secretary .....Chicago, Ill.

The Hollenden Hotel.

TUESDAY AFTERNOON, SEPTEMBER 11

2:00 P. M. to 5:00 P. M.

"Shock"
By George W. Crile, (M.D.) .....
.....Cleveland, Ohio

Discussed by
Truman W. Brophy .....Chicago, Ill.
Don M. Graham .....Detroit, Mich.

"Alveolar Process Resection"
By Carl D. Lucas .....Indianapolis, Ind.

Synopsis—Purpose, prosthetic restoration requirements. Elimination of oral foci of periapical infection. Care of isolated areas of pathologic lesions. Importance of unbroken chain of asepsis. Considerations in bone surgery. Anesthetics. Care of patients pre-operatively and post-operatively if general anesthetic is to be employed. Hospitalization of these operative cases always appreciated by the patients. Preparation of the field of operation. Manipulative technic of complete and partial upper resections. Manipulative technic of complete and partial lower resections. Resections frequently necessary as a post-extraction requisite for cosmetic denture construction. Resections contraindicated in many cases of extraction. Study models necessary. Suturing. Ridge requirements. Muscular attachments. Healing and resultant shrinkage. Scar tissue density. Temporary denture restorations. Secondary denture restorations. Osseous resorption following resection. Co-operation with the prosthetist in all cases.

Discussed by
Frederick B. Moorehead .....Chicago, Ill.
Frederick F. Molt .....Chicago, Ill.

WEDNESDAY MORNING, SEPTEMBER 12

9:00 A. M. to 12:00 M.

"Plastic, Facial and Maxillary Surgery"
By G. V. I. Brown .....Milwaukee, Wis.

Synopsis—Widened experience has taught plastic surgeons that many more or less spectacular operative undertakings are really very simple and with ordinary skill and care almost uniformly successful. Stereopticon illustrations covering a wide variety of facial reconstructive operations will be shown to present as clearly as possible the reasons for the plastic operative precepts that are recommended and to show the results of their application.

Discussed by
Chalmers J. Lyons .....Ann Arbor, Mich.
William L. Shearer .....Omaha, Nebraska

"Importance of Technic in Administering Nitrous Oxid and Oxygen Anesthesia"
By C. K. Teter .....Cleveland, Ohio

Synopsis—Of all the general anesthetics, Nitrous Oxid is the most difficult to administer and requires a nearer perfect technic than any of the others. The vast majority of all complications encountered when administering Nitrous Oxid and Oxygen are due to faulty technic. It has often been said by the operating surgeon that a good anesthetist is born, not made. It is just as essential in this specialty as in any other specialty of medicine or dentistry that one who enters it should be endowed with special qualifications and aptitude along this line. A successful anesthetist is an artist as well as a scientist. He

must be endowed with quick perception, quick diagnostic ability and a thorough knowledge of physiology, anatomy and pathology. He must be familiar with the scientific and chemical reactions produced by the agents used. There is no short-cut to real success and expertness in any line without a great deal of study and hard work. The day of the overnight specialist is, or should be past for such are not deserving of support from the professions. There is a crying need for competent post-graduate instruction in this line of work, open to all who may desire it.

Discussed by
B. H. Harms .....Omaha, Nebraska
J. A. Heidbrink .....Minneapolis, Minn.
E. I. McKesson (M.D.).... Toledo, Ohio

WEDNESDAY AFTERNOON, SEPTEMBER 12

2:00 P. M. to 5:00 P. M.

"Focal Infection and Dental Diseases"
By Edward H. Hatton, (M.D.) .....
.....Chicago, Ill.

Synopsis—In chronic alveolar abscess sections through the diseased apices and the investing bone. Show changes which will be demonstrated by micro-photographs and specimen. The relationship of these changes to dissemination of infection will be discussed. In addition the factors of importance in arriving at a diagnosis of focal infection will be appraised, especially such laboratory tests as blood analysis.

Discussed by
John G. Meisser .....Rochester, Minn.
T. A. Hardgrove .....Fond du Lac, Wis.

"Foreign Bodies of Dental Origin in Air and Food Passages"
By Carlos E. Pitkin .....Cleveland, Ohio

Synopsis—Foreign bodies encountered in the air and food passages, from the oral cavity and as a result of oral surgical procedures. Prophylaxis, localization and methods of removal. Illustrative cases. Lantern slides.

Discussed by
Claire L. Straith .....Detroit, Mich.
Joseph P. Wahl .....New Orleans, La.

"Atypical Neuralgias and Their Treatment"
By S. L. Silverman .....Atlanta, Ga.

Synopsis—A brief presentation of method of treatment through the use of cantharides, by which gratifying results have been obtained in cases of head pains not of the tic type.

THURSDAY MORNING, SEPTEMBER 13

9 A. M. to 12 M.

"Surgery of the Antrum of Highmore"
By Virgil Loeb .....St. Louis, Mo.

Synopsis—Anatomical relationship of the Antrum of Highmore to the mouth and nose. Consideration of variations in size and shape in the same individual. Etiology and diagnosis of antral diseases which may require surgical interference. Indications and contra-indications for such interference. Types of operations.

Discussed by
Theodor Blum .....New York, N. Y.
M. N. Federspiel .....Milwaukee, Wis.

"Cysts and Tumors of the Jaws"
By Henry S. Dunning ....New York, N. Y.

Synopsis—1. Their occurrence. Frequency, site, characteristics. 2. Etiology. Predisposing causes of age, sex, etc. The dental surgeon's responsibility. 3. Pathology of; Variations of; Classification. 4. Diagnosis. Methods of establishing same. Interpretation of x-rays. 5. Treatment of; When to operate. (a) Operative Method of operation. (b) Non-operative. Anesthesia. 6. Prognosis.

Discussed by
Rea Proctor McGee .....Pittsburgh, Pa.
Arthur E. Smith .....Chicago, Ill.

ORTHODONTIA AND PERIODONTIA

(Ballroom, Statler Hotel. All subsequent meetings held in same place.)

OFFICERS OF SECTION

Clyde M. Gearhart, Chairman .....
.....Washington, D. C.
William C. Fisher, Vice-Chairman .....
.....New York, N. Y.
B. Frank Gray, Secretary ....San Francisco, Cal.

TUESDAY AFTERNOON, SEPTEMBER 11

2:00 P. M. to 5:00 P. M.

"The Alimentary Tract, a Talk to Dental Patients"
By Gillette Hayden .....Columbus, Ohio

Synopsis—The mouth the first of three reservoirs. Its strategic position as the port of entry; its service to the whole body; its share

in the choice of foods and in their preparation for the second reservoir, the stomach. The journey of the body's fuel from the second to the third reservoir or colon. Some of the effects of an imperfectly used or a crippled dental apparatus upon the other parts of the alimentary tract.

Discussed by
Celia Rich .....Nashville, Tenn.
E. Melville Quinby .....Boston, Mass.

The Statler Hotel.

"Clinical Evidence, with a Working Hypothesis, Favoring Pulp Extirpation in Children's Teeth"

By Norris C. Leonard .....Baltimore, Md.

Synopsis—For orthodontic reasons, alone, continued healthy functioning of the deciduous teeth, and the preservation of the permanent ones erupted during the developmental period of the jaws is of immense importance. A simple method is presented for consideration of both the general practitioner and the orthodontist for treatment of pulp exposures, favoring the physiological shedding of the deciduous teeth, and continued development of the incompletely calcified roots of the permanent ones.

Discussed by
U. G. Rickert .....Ann Arbor, Mich.
Harry E. Kelsey .....Baltimore, Md.

"The Varied Reactions to Injury from Traumatic Occlusion"

By Paul R. Stillman ....New York, N. Y.

Synopsis—The paper discusses and differentiates between stimulation and irritation. The phenomenon of irritation being the fundamental factor in the etiology of inflammation, viz., "a reaction to injury." Disease of the peridontium and allied structures is described as an inflammation. Several very unusual cases are described and discussed, the cases being selected with the intention of showing

Section on Orthodontia, Hotel Statler, Meeting Place.

"the varied reactions to injury from traumatic occlusion." This relation of the teeth is identified as a mechanical injurious agent whose influence is at times a stimulant and induces inflammation according to the degree of resistance to attack. The subject is also discussed as to whether traumatic occlusion occurs as a result of migration due to inflammation or if it is a constant factor in those cases having it, and is thereby of itself the cause of disease.

The relation of traumatic occlusion as it has been observed when induced by the migration of teeth through orthodontic treatment is discussed. A distressing case illustrating such an instance is described. Slides of clinical cases will be shown.

Discussed by
Frank M. Casto .....Cleveland, Ohio
Olin B. Kirkland .....Montgomery, Ala.

WEDNESDAY MORNING, SEPTEMBER 12

9 A. M. to 12 M.

"The Nomenclature of Periodontology"
By John Oppie McCall ....Buffalo, N. Y.

Synopsis—Periodontology is a branch of dentistry whose development has been very rapid in the past ten years. With increasing knowledge there has come the need for a terminology adequate to express this knowledge. The terms presented in this paper are largely those which have been adopted by the American Academy of Periodontology. Many of these are in use in the dental literature of today. But it has been thought advisable to present a somewhat extended discussion of these words, to make clear their correct usage, and to give opportunity for debate as to their suitability.

Discussed by
R. Ottolengui .....New York, N. Y.
L. Pierce Anthony .....Philadelphia, Pa.

"Bridgework from a Periodontist's Standpoint"
By Andrew J. McDonagh .....
.....Toronto, Canada.

Synopsis—The effect of artificial substitutes for teeth which have been lost as far as the investing tissues of the other teeth are concerned. The reasons given for the injurious torque. How torque acts on the investing tissues of the natural teeth; why pocket formation takes place; why so-called recession of the gingival tissues takes place; why one kind of artificial restoration has less injurious effect on the periodontal tissues than another kind. How fixed bridgework compares with removable bridgework in this connection and the best method, from the standpoint of preservation of the periodontal tissues. The best method of replacement from the standpoint of periodontal tissues.

Discussed by
Arthur H. Merritt .....New York, N. Y.
Justin D. Towner .....Memphis, Tenn.

To the memory of Calvin S. Case, who, life permitting, would have occupied this hour with a valuable presentation on "The Early Regulation of Children's Teeth."

"Calvin S. Case, The Teacher"—John P. Buckley.

"Calvin S. Case, The Author"—Otto U. King.

"Calvin S. Case, The Practitioner and Scientist"—Hart J. Goslee.

"Calvin S. Case, The Man"—C. N. Johnson.

"Calvin S. Case, The Orthodontist and Friend" Thos. L. Grisamore.

WEDNESDAY AFTERNOON, SEPTEMBER 12

2:00 P. M. to 5:00 P. M.

(Wednesday afternoon to be devoted to program of Detroit Clinic Club.)

THURSDAY MORNING, SEPTEMBER 13

9 A. M. to 12 M.

"Orthodontic Eruption of Impacted Cuspids and Incisors"*
By Varney E. Barnes .....Cleveland, Ohio

Synopsis—1. Expand to provide *extra space* for impacted tooth. 2. Fit removable retainer as anchorage. Add springs and hooks to hold surgical packing. 3. Surgical exposure of impacted tooth. 4. Fit packing of paraffin saturated spunk over tooth to fill wound. Attach to retainer. Cover packing with antiseptic powder and lock appliance in place. 5. Apply antiseptic and replace frequently until wound heals, exposing tooth. 6. Band tooth if possible, or drill pit for special locked inlay, carrying loop or hook. 7. Erupt tooth with orthodontic pressure.

Discussed by
Herbert A. Pullen .....Buffalo, N. Y.
Burt Abell .....Toledo, Ohio

"Endocrine Activity as Applied to Orthodontic Types of Unknown Origin"
By C. C. Howard .....Atlanta, Ga.

Synopsis—A general consideration of bony development viewed from the standpoint of ductless gland disorders. Association of dental arch and jaw mal-formation is studied in the correlation of such disturbances. An attempt is made to definitely connect these phenomena, considering the possibility of linking together an imbalance of the glandular system with improper arch progress.

Discussed by
Albert W. Crosby .....New Haven, Conn.
Joseph D. Eby .....New York, N. Y.

MOUTH HYGIENE AND PREVENTIVE DENTISTRY

(Arena, Public Hall. All subsequent meetings held in same place, except Thursday A. M., which will be held in Lounge, Public Hall.)

OFFICERS OF SECTION

Wm. H. Card, Chairman ....Minneapolis, Minn.
L. G. Mitchell, Vice-Chairman .....
.....Los Angeles, Cal.
Thos. B. McCrum, Secretary .....
.....Kansas City, Mo.

*A paper and clinic.

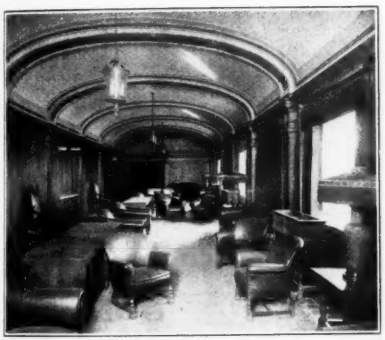
TUESDAY AFTERNOON, SEPTEMBER 11

2:00 P. M. to 5:00 P. M.

"The Problem of Introducing Oral Hygiene into the Public Schools as a Course of Study"
By R. S. Towne .....Bismarck, N. D.

Synopsis—1. Co-operation of the educational authorities with the dental association. 2. Instruction of teachers and school nurses. 3. Supplying texts for use in teaching the subject.

Discussed by
Earl S. Braithwaite .....Willard, Ohio



Library and Lounge, Public Auditorium.

"Marion School Class after a Dozen Years"
By Cordelia O'Neill ....Cleveland, Ohio

(Some of the Marion School Class, two of whom are now dentists will be present at this meeting.)

Discussed by
Leonard G. Mitchell ....Los Angeles, Cal.

"Publicity Methods in Oral Hygiene"
By Rea Proctor McGee ....Pittsburgh, Pa.

Discussed by
Sidney J. Rauh .....Cincinnati, Ohio

"Scope and Phases of Preventive Dentistry from the Forsyth Clinics"
By Harold DeWitt Cross ....Boston, Mass.

Discussed by
Thos. B. McCrum .....Kansas City, Mo.

"The Establishment of a Mouth Hygiene Division in State Departments of Health"
By Taliaferro Clark, (M.D.),
(U.S.P.H.S.) .....Washington, D. C.

Discussed by
Alfred C. Fones .....Bridgeport, Conn.

WEDNESDAY MORNING, SEPTEMBER 12

9 A. M. to 12 M.

"Results Obtained by Five Years' Thorough Dental Work for School Children of West Virginia" (With Motion Pictures).
By G. T. Epling .....Welch, W. Va.

Discussed by
E. L. Pettibone .....Cleveland, Ohio
Geo. C. Howard .....West Union, W. Va.

"Nutrition and Function in Relation to the Teeth"
By Wallace Seccombe ....Toronto, Canada

Discussed by
Clarence J. Grieves .....Baltimore, Md.
Harold DeWitt Cross .....Boston, Mass.

"Who is an Oral Hygienist"
By Evelyn C. Schmidt ....Boston, Mass.

Discussed by
Harold J. Leonard ....Minneapolis, Minn.
Gladys Eyrich .....Jackson, Miss.

"Proposed State Training School for Hygienists"
By A. C. Fones .....Bridgeport, Conn.

Discussed by
Guy S. Millberry .....San Francisco, Cal.

"The Dental Hygienist, Her Place in Schools; Industry; Hospital Service; and in the Private Dental Office"
By C. J. Hollister .....Harrisburg, Pa.

Discussed by
Henry L. Banzhaf .....Milwaukee, Wis.

WEDNESDAY AFTERNOON, SEPTEMBER 12

2:00 P. M. to 5:00 P. M.

"Scope of Work in an Industrial Dental Clinic"
By R. W. Elliott (M.D.) .....
.....Cleveland, Ohio

Discussed by
H. M. Brewer .....Dayton, Ohio

"Dental Education and Industrial Dental Clinics"
By H. L. Banzhaf .....Milwaukee, Wis.

Discussed by
A. G. Buckner .....Nashville, Tenn.

"Methods of Teaching Oral Hygiene With Lesson Outlines"
By John P. Erwin .....Perkaskie, Pa.

Discussed by
Rea Proctor McGee .....Pittsburgh, Pa.

THURSDAY MORNING, SEPTEMBER 13

9:00 A. M. to 12:00 M.

"Diet in its Relation to Growth and Development, with Special Relation to the Teeth"
By John E. Gurley ....San Francisco, Cal.

Synopsis—(a) The pregnant mother. (b) From birth to two years.

Discussed by
Wallace Seccombe .....Toronto, Canada

"Pediadontia—What is it?"
By Philip R. Thomas .....
.....Minneapolis, Minn.

Discussed by
John E. Gurley .....San Francisco, Cal.

"Dentistry for Children, Development and Care of Same"
By Richard A. Suhr .....Cleveland, Ohio

Discussed by
M. Evangeline Jordon.... Los Angeles, Cal.

"The Care with Filling Procedure of Deciduous Teeth and the First Permanent Molar."
By Wm. Z. Hill .....Philadelphia, Pa.

Synopsis—Starting time, examinations, talk to patient, cavity preparation, filling material, treatment of involved pulps.

Discussed by
Walter Liles .....Richmond, Va.

"Oral Hygiene in The Bridgeport Schools"
By Mrs. Hubert W. Hart .....
.....Bridgeport, Conn.

Discussed by
Philip R. Thomas .....Minneapolis, Minn.

HISTOLOGY, PHYSIOLOGY, PATHOLOGY, BACTERIOLOGY AND CHEMISTRY (RESEARCH)

(Stage, Public Hall. All subsequent meetings held in same place.)

OFFICERS OF SECTION

Weston A. Price, Chairman ....Cleveland, Ohio
Julio Endelman, Vice-Chairman .....
.....Los Angeles, Cal.
Harris R. C. Wilson, Secretary .....
.....Cleveland, Ohio

TUESDAY AFTERNOON, SEPTEMBER 11

2:00 P. M. to 5:00 P. M.

A Symposium on "Evidences For and Against Nutrition, or Calcification Changes of Enamel After Tooth Eruption"

1. Newer Histological Data on the Structure of Enamel.
By J. Leon Williams ....New York, N. Y.

2. Enamel Rod Sheaths, The End Organs of the Dentoenamel Circulation.
By Charles F. Bodecker .....
.....New York, N. Y.

3. Changes of Enamel After Tooth Eruption.
By U. G. Rickert .....Ann Arbor, Mich.

4. Physiological Changes in the Structure of the Enamel After Tooth Eruption.
By Theodor B. Beust .....Louisville, Ky.

5. Permeability of Enamel.
By William G. Skillen .....Chicago, Ill.

WEDNESDAY MORNING, SEPTEMBER 12

9:00 A. M. to 12:00 M.

A Symposium on "Factors Constituting Potential Dangers from Dental Infection"

1. Evidences of the Relation Between Systemic Involvements and Dental Foci.
By John G. Meisser ....Rochester, Minn.

2. Calcification Within the Canals of Teeth.
By William G. Skillen .....Chicago, Ill.

3. Histopathology of Teeth and Associated Structures in Situ with Case History, Radiographic, and Post-Mortem Findings.
By Karl Meyer, (M.D.) .....Chicago, Ill.
and
C. S. Suddarth .....Chicago, Ill.

4. Dentistry's Relation to Psychopathology.
By E. A. Thomas .....Hastings, Neb.

WEDNESDAY AFTERNOON, SEPTEMBER 12

2:00 P. M. to 5:00 P. M.

Miscellaneous Research Reports.

1. The Importance of the Wetting Phenomena in Bacteriology.
By W. P. Larson, (M.D.) .....
..... Minneapolis, Minn.
and
T. B. Hartzell .....Minneapolis, Minn.

2. Report on Decalcification of Enamel.
By Thomas B. Hartzell .....
.....Minneapolis, Minn.

3. Renal Changes in Primary Hypertention.
By E. T. Bell, (M.D.) .....
.....Minneapolis, Minn.

4. The Effects of Nutritional Disturbances Upon Calcification and Decalcification of Teeth in Experimental Animals.

By John A. Marshall ....San Francisco, Cal.

5. Further Studies in the Physiological and Pathological Variations in the Composition of Human Saliva.

By Henry C. Ferris .....New York, N. Y.

1. Some Experimental Effects of Deficient Diets on the Monkey.

By Percy R. Howe .....Boston, Mass.

2. Comparative Analyses of Blood and Saliva, with Special Reference to Such Substances as Sugar, Urea, Calcium and Other Mineral Constituents.

By Edw. H. Hatton, (M.D.) .....
.....Chicago, Ill.

View of Stage With Organ Console in Foreground.

THURSDAY MORNING, SEPTEMBER 13

9:00 A. M. to 12:00 M.

A Symposium on "The Nature of Defensive Forces Preventing Each (a) Dental Caries, (b) Periodontoclasia, (c) Systemic Involvements from Dental Infections."

3. The Relationship Between Clinical Evidence and Blood Chemistry in Focal Infections.

By B. J. Bixby, (M.D.) ....Buffalo, N. Y.

4. Calcium Metabolism in Relation to Susceptibility to and Defense Against (a) Dental Caries, (b) Periodontoclasia, (c) Systemic Involvements from Dental Infections.

By Weston A. Price.....Cleveland, Ohio

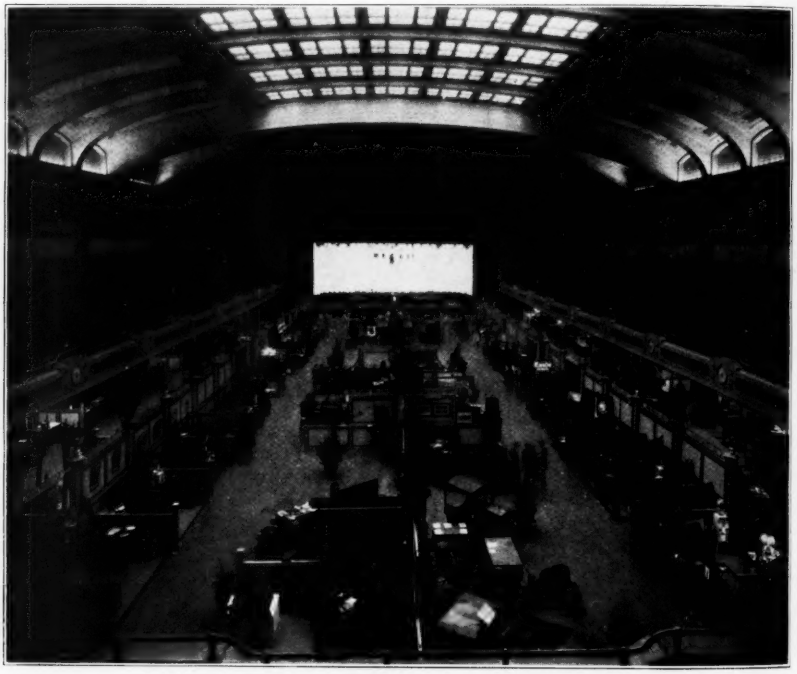
THE CLINIC PROGRAM

The clinic program for the Cleveland meeting, in so far as it has been completed to date, is herewith submitted. All clinics will be given on Thursday afternoon or Friday morning. You will note that in order to insure an equitable distribution of clinicians, the allotment of clinics awarded to the several states has been in accordance with the membership in the American Dental Association, and is based upon state representation in the House of Delegates.

No clinician has been accepted without the endorsement of a committee from his state society, assuring the membership of the selection of outstanding talent to represent each component organization.

It will be noted that a number of states have neglected to respond to the invitation up to this time, but we believe that much of the work now under way will result in the completion of their quota within the next few weeks. It is hoped that the names of desirable clinicians holding membership in states falling below their quota in this issue will be forwarded to the presidents of their respective state societies in order that their services may be secured in time for publication in the program. Section clinics will be given in conjunction with the general clinics by essayists who desire to supplement the papers which they have presented before their respective sections. Thus will the subject matter of section discussions become available to the entire membership.

Groups and study clubs will occupy another section and will not be counted under the



Dental Health Exhibit and Clinic Hall in Public Auditorium.

state limitation; but no state will be permitted to furnish more than three groups in addition to their authorized quota of individual clinicians.

The Ohio State Dental Society, acting as our host, will furnish a general program of fifty clinicians and will occupy a section.

All who have seen the magnificent auditorium in Cleveland will readily appreciate our opportunity fos staging a wonderful clinic. Special booths now under construction will bear placards of the states represented and will afford ample opportunity for each individual clinic to be seen and fully understood without interruption. Don't miss the clinics.

P. G. PUTERBAUGH,
General Chairman of Clinics.

GENERAL AND GROUP CLINICS

Classified by States

ALABAMA

(Expected to furnish three clinicians)

ALASKA

(Expected to furnish two clinicians)

ARKANSAS

(Expected to furnish three clinicians)

"Care of the Gingival Crevice in Prophylaxis and Pyorrhea"
Mounted specimen together with illustrations demonstrating normal and pathological conditions of teeth, and gum tissue. Proper method of brushing and instrumentation.
By J. E. Crozier .....Little Rock

"The Practical Application of the Cast Clasp in Partial Denture and Bridge Construction"
A technic for the accurate construction of cast clasps and a demonstration, with models, of the application of the cast clasp to partial denture and bridge construction.
By M. H. Gray .....Little Rock

"A Standardized Technic for Casting Using the Same Principles From the Inlay to the Gold Plate"
(Group Clinic)
A. Boil-out technic for elimination of wax.
B. Casting dentures and gold bases for full cases.
By F. G. White .....Fort Smith
C. Casting inlays and three quarter crowns in 30 minutes.
By T. J. Newman .....Little Rock
J. D. Jordon .....Little Rock
E. L. Miley .....Fort Smith

ARIZONA

(Expected to furnish two clinicians)

CALIFORNIA STATE

(Expected to furnish eight clinicians)

"Porcelain Jacket Crowns"
By Hugh Avary .....San Francisco

"Continuous Gum Dentures"
By James Allen Graham ....San Francisco

"Pyorrhea Surgery and Protection of Mouth Wounds"
Using a skull instead of patient the various steps of alveolar curettage, gum excision and the protection of the wound will be demonstrated.
By A. W. Ward .....San Francisco

CALIFORNIA

"Orthodontia"
By B. Frank Gray .....Berkeley

COLORADO

(Expected to furnish five clinicians)

"Alveolotomy"
By M. R. Howard .....Denver

"Incisions and Flap Formations for Oral Surgery"
Demonstrated on Models and Skull
By John W. Seybold .....Denver

"Prosthesis"
1. Preparation to show that spherical surfaces allow balanced relation in all positions.
2. Spherical bite method showing central occlusion and range of occlusion.
3. Preparation showing relation of curve of Spee to condyle path and the depth of cusp and overbite.
4. Preparation showing that central occlusion may be established at any point within the range of occlusion by proper arrangement of inclined planes.

By J. W. Needles .....Pueblo

CONNECTICUT

(Expected to furnish five clinicians)

"Some Bridge Attachments"
By J. D. Hertz .....Stamford

"Heat-Treatment of Platinum Gold Alloys"
By F. T. Murlless, Jr. .....Hartford

"Definite Technic for Localizing Impacted Lower Third Molars"
By George C. Fahy .....New Haven

"Partial Compound Impressions"
By E. Frank Cory .....New Haven

"Spring Attachments for Clasps on Lingual Bar Plates"
By Morton J. Loeb .....New Haven

DELAWARE

(Expected to furnish two clinicians)

DISTRICT OF COLUMBIA

(Expected to furnish three clinicians)

"Preparation For and Construction of Three Quarter Cast Crown"
By Vernon J. Lohr .....Washington

FLORIDA

(Expected to furnish three clinicans)

GEORGIA

(Expected to furnish five clinicians)

HAWAIIAN ISLANDS

(Expected to furnish two clinicians)

IDAHO

(Expected to furnish two clinicians)

ILLINOIS

(Expected to furnish twenty-three clinicians)

"Reproducing Plates Made Too Soon After Extraction"
By H. O. Browning .....Chicago

"Prevention in Dentistry"
Prevention of Caries by (1) prophylactic procedures; (2) by chemical application; (3) by cements.
Prevention of Malocclusions by (1) early diagnosis; (2) by early radiographic interpretation; (3) by space retainers.
By F. Blaine Rhobotham .....Chicago

"Cast Gold Inlays"
Finished and unfinished cast gold inlays using a wax eliminator.
By A. P. Grunn .....Chicago

"Closing Persistent Fistulas Between Antrum and Mouth"
Showing various means of closing these openings from simple freshening of surfaces to the moving of tissue flaps and the lines of incision for these flaps.
By Earle H. Thomas .....Chicago

"Casting of Porcelain"
Casting of Porcelain using an investment which makes it possible to boil out wax.
By M. S. Sorley .....Chicago

"Macroscopic and Microscopic Dentoalveolar Pathology"
Microscopic slides from sections through alveolar process with teeth in situ with case histories, post mortem findings of patients and ante and post mortem radiograms.
By C. S. Suddarth .....Chicago

"Movable—Removable Bridge Construction"
By Thomas P. Rose .....Chicago

"Fixed Bridge Attachments for Vital Teeth"
Demonstrating with the aid of large models, a method of attachments as applied to vital teeth.
By G. R. Churchill .....Chicago
F. G. Conklin .....Chicago
H. C. Lee .....Chicago

"Making Gold and Aluminum Castings with an Automatic, Electric, Pyrometer Machine"
Demonstration of a unique method of employing a combination of gold and aluminum in partial denture construction—casting both metals into one mold.
By F. E. Roach .....Chicago

"Combined Chair and Table Clinic with Patient"
A. Full maxillary and mandibular continuous gum dentures, built by Rene Cournand of Paris, France.
B. Full maxillary and mandibular dentures illustrating different arch forms with modifications in tooth arrangements for class one, two and three ridge relations.
C. Corrected case of maxillary prognathism with technic models of steps in treatment. Photographs of patient before and after treatment.
D. Application of continuous gum on partial dentures and bridgework.
E. A Porcelain Shell Crown.
F. Porcelain Jacket Crowns.
By R. O. Schlosser and J. F. Christiansen ..... Chicago

"Root-Canal Technic"
By L. L. Davis .....Chicago

"Fixed Sterilization of Teeth Using Violet Blue Brilliant Green"
By E. L. Griffith .....Freeport

"Porcelain Dowel Crowns"
Technic for anterior and posterior dowel crowns, using all porcelain teeth, obtaining accurate adaptation—Maximum strength and aesthetic effect—reducing to a minimum gingival irritation.
By C. M. Smith .....Peoria

"Repalating Upper and Rebasing Lower Dentures"
Practical demonstration of service to the patient using "Impression Compound" in full dentures built over soft irregular ridges; also technic for "Repalating the Upper" and the "Rebasing of Lower" dentures.
By Virgil P. Perisho .....Streator

"Single Cast Removable Bridges for Vital Teeth"
By Frank E. Roe .....Streator

"Gold Inlays and Fixed Bridge Attachments"
By P. A. Pyper .....Pontiac

"Cavity Preparation and Construction of Cast Gold Inlays by the Indirect Method"

This clinic will deal with complicated cavity preparation in an attempt to show the practicability of the use of the gold inlay for extremely large and difficult restorations.

By Arthur L. Lee .....Flanagan

CHICAGO PROSTHETIC CLINIC CLUB

W. H. Heermans, Director

"Full Denture Construction"

Preliminary impressions; final impressions; mandibular registrations; freways; casts and mounting; arch forms; occlusion; mounting for regrind; vulcanization; rebasing; regrinding; adjustments. (To be given by ten clinicians.)

INDIANA

(Expected to furnish eight clinicians)

"Orthodontia Treatment with Ribbon Arch"

By E. L. Mitchell .....Indianapolis

"Technic for Full Upper and Lower Using Deep Bite Posteriors"

Normal Overbite, Prognathous and Orthognathous.

By Walter E. Beyer .....Indianapolis

"Using a Flat Pin Facing as a Removable Facing in Crown and Bridgework"

The flat pin designed to take the place of the round pin facing in soldered crown and bridge construction is still subjected to heat and difficult of repair which by this technic is eliminated.

By D. A. House .....Indianapolis

"Fixed Bridge and Denture Clinic"

Upper and lower posterior sanitary fixed bridges with three quarter abutments for vital teeth, as constructed by using the jaws as an articulator; showing distinct advantage of a swedged upper gold denture over a cast and swedged upper gold denture.

By Robert H. Hopkins .....Indianapolis

"Partial Plates with Cast Clasps Using Modeling Compound Impressions"

By J. B. Carr .....Indianapolis

"Indianapolis Dental Credit Bureau"

By Robert White Blake ....Indianapolis

"A Denture Prognoanalysis Chart"

A means by which we may measure the success of a denture, locate troubles, apply remedies, and have a preliminary understanding of the patient.

By Robert Gillis .....Hammond

"Accurate Post Damming"

Method of post damming while plate is being constructed to know exactly where and how much post damming is needed.

By Charles A. Priest .....Marion

IOWA

(Expected to furnish nine clinicians)

"Porcelain Jacket Crown"

By Craig M. Work .....Ottumwa

"Fixed Bridgework with Particular Reference to Diagnosis and Ceramics and Construction of Broken Stress"

By Donald E. Smith .....Sioux City
J. A. Bliss .....Sioux City
E. W. Howard .....Des Moines

"Surgical Pyorrhea"

In advanced cases a portion of the gum tissue will be removed and the alveolar process curetted; in mild cases curetting of the process only.

By W. J. Charters .....Des Moines

"Gold Foil Restoration with Special Attention to Toothform"

By H. A. True .....Des Moines

"Facial Casts Before and After Orthodontia Treatments"

Full plaster facial casts showing how the profile can be improved by correcting malocclusion.

By R. W. Noland .....Des Moines

"A Gold Jacket Crown"

A new technic for the construction of a cast crown, showing ease in construction and assuring a proper fit after casting.

By Joseph B. Kennedy .....Des Moines

"Three Quarter Crown, A Special Attachment and Gold Inlay Used in Fixed Crown and Bridgework"

Models of preparations in wax and finished castings—methods used in preparation, etc., where and when used; finished bridges mounted on technic casts.

By J. Frederick Walter .....McGregor

"A method of Investing Inlay Models and the Elimination of Wax and Moisture"

A method of safely removing the wax and providing for the escape of air in the mold cavity when the gold is entering same by removing air resistance.

By L. L. Poston .....Council Bluffs

"A Quick Casting Method"

A partial boil-out and quick carbonizing casting process by which the mixing, setting and burning out may be done in less than fifteen minutes.

By E. I. Rosheim .....Roland

"Public School Dentistry"

A quick and easy method of filling, prolonging the life, and preventing decay of deciduous teeth and six year molars in extreme cases of children difficult to control.

By Grayson G. Garrison .....Burlington

"Cavity Preparations and Castings for Gold Inlay and Three Quarter Crowns"

Explanation of the importance of tooth form, cavity preparation, carving and casting to obtain successful inlays; also instruments used in operations.

By H. J. Altfillisch ..... Dubuque

KANSAS

(Expected to furnish six clinicians)

(Title to be furnished later)
By D. T. Parkinson ..... Wichita

(Title to be furnished later)
By E. E. Welch ..... Topeka

(Title to be furnished later)
By G. A. Crise ..... Manhattan

(Title to be furnished later)
By E. J. Cutshaw ..... Phillipsburg

(Title to be furnished later)
By C. E. Tuttle ..... Wichita

(Title to be furnished later)
By H. M. McFarland ..... Kansas City

KENTUCKY

(Expected to furnish five clinicians)

"A practical Demonstration of the Details, in the Investing and Casting of Full and Partial Dentures"

By L. C. Burgard ..... Louisville

"Some Applications of the Casting Process to Crown and Bridgework"

Restoring broken porcelain crown with casting plus veneer of baked or synthetic porcelain. Cast crowns and pontics with porcelain veneer. Technic of the application of synthetic veneer.

By Edward Hubbuch ..... Louisville

"A Definite Technic of Transfer of Bites to an Articulator"

By I. H. Harrington ..... Louisville

"Fixed Bridge Replacement with Positive Support which Allows for Normal Tooth Movement"

By Raymond E. Grant ..... Louisville

"A Demonstration of Cast Gold Denture Technic"

By Garnett H. Smith ..... Louisville

"Partial Dentures"

A few diversified conditions indicating partial denture construction with and without compensation anchorage for some of the simpler forms of clasp attachments.

By William Randall ..... Louisville

LOUISVILLE INLAY UNIT

"Practical Cavity Preparation"
By George H. Means ..... Louisville

"Wax Manipulation and Investing"
By Robert L. Sprau ..... Louisville

"Wax Dissipation and Casting"
By W. E. Goepper ..... Louisville

KENTUCKY LOCAL ANESTHESIA UNIT

"Conductive and Infiltration Anesthesia"

Indications and Contra Indications; Special attention to the Anatomy of Parts; Armamentarium, Preparation of Patient; Preparation of Solution; Simple Technic for all Injections.

By E. C. Hume ..... Louisville
A. P. Williams ..... Louisville
Frank B. Hower ..... Louisville
M. B. Guthrie ..... Lexington
James S. Dailey ..... Lexington

LOUISIANA

(Expected to furnish three clinicians)

MISSISSIPPI

"Cast Gold and Porcelain Restorations"
By W. C. Dennis ..... Jackson
R. S. Neyland ..... Jackson
G. S. Handy ..... Natchez
E. D. Hood ..... Tupelo
J. N. C. Moffat ..... Clarksdale

"A New and Novel Method of Thoroughly Cleaning the Mouth"
By Dr. J. N. C. Moffat and three nurse assistants ..... Clarksdale

MAINE

(Expected to furnish — clinicians)

MARYLAND

(Expected to furnish three clinicians)

"Wire Arch Adjustments with Heat"

A method of making and measuring accurately the slight successive changes necessary to control and direct the spring tension of wire arches in their relation to moving teeth.

By Norris C. Leonard ..... Baltimore

MASSACHUSETTS

(Expected to furnish eleven clinicians)

"Arch Predetermination"

1. Method of determining tooth substance in a given arch.
2. Method of surveying the malformed arch.
3. Method of using predetermined arch on cases of malocclusion to show required movement.
4. Case models, showing the practical application of the normal orthodontographic arch from the starting of case, through transition period to completion, and two years after all appliances have been removed.

By William H. Gilpatric ..... Boston

"Ceramics"
Table clinic and exhibit of a variety of porcelain crowns, clasp removable bridges, and fixed porcelain bridge on a platinum frame of new design.
By W. G. Bridge .....Boston

"Denture Prosthesis, Full and Partial"
(Group Clinic)
By W. H. Hoyt .....West Somerville
F. W. Allen .....Boston
R. Ruelberg .....Brighton
A. Gahm .....Brighton

"Dental Orthopedics"
Expansion of narrow temporary arches permitting the proper growth and eruption of the permanent teeth without orthodontic aid, giving natural function, beauty and efficiency.
By Moses Joel Eisenberg .....Roxbury

"The Etiology, Diagnosis and Treatment of Early Periodontal Lesions"
Illustrations and lantern slides of radiograms showing periodontal disintegrations from the ages of twelve to twenty-one, including an explanation of the proper correction of a traumatic occlusion.
By Benjamin Tishler .....Boston

"Fundamentals in Technic of Partial Denture and Crown and Bridge Prosthesis"
A demonstration of the various steps in crown and bridge, clasp and simple partial denture construction.
By George Phillips .....Boston

Michigan

(Expected to furnish eleven clinicians)

Detroit Clinic Club

Preventive Dentistry

"The Prevention of Diseases and Conditions Which May Result in the Destruction of the Hard Structures of the Teeth"
By Ruth M. Conway .....Detroit

"The Prevention of Diseases and Conditions Which May Result in the Destruction of the Dental Pulp"
By William F. Northrup .....Detroit

"The Prevention of Diseases and Conditions Which May Result in the Destruction of the Periodontal Tissues"
By Clayton H. Gracey .....Detroit

"The Prevention of Diseases and Conditions Which May Result in Malocclusion"
By Harry T. Wood .....Detroit

"Preventive Dentistry"
By Russell W. Bunting .....Detroit

"The Value of Record Charts and Study Models to Preventive Dentistry"
By George C. Bowles .....Detroit

"The Relation of Hygiene to Preventive Dentistry"
By Grace Rogers Spalding .....Detroit

Battle Creek Clinic Club

"A Method of Constructing Abutment Pieces for Vital Teeth"
Tooth Preparation.
By B. F. Johanson .....Battle Creek

"Construction of Anterior Abutment Piece"
By R. A. Roelofs .....Battle Creek

"Construction of Posterior Abutment Piece"
By F. D. Loomis .....Battle Creek

"Finished Models"
By C. S. Larned .....Battle Creek

Detroit Clinic Club (*Surgical Section*)

"Anesthesia, Block and Infiltration"
1. Sterilization, drugs and armementarium.
2. Showing technic by use of dry specimen.
3. Showing technic by use of wet specimen.
4. Showing technic by use of waxed specimen.
5. Showing technic by use of slides and moving pictures.

By Don M. Graham .....Detroit
W. A. Cook .....Detroit
R. G. Hayward .....Detroit
J. W. Kemper .....Detroit
C. J. Hall .....Detroit
Clare Straith .....Detroit

Detroit Dental Clinic Club

R. L. Girardot, Director.

"Technic for Handling Pulpless Teeth"
A complete course of instruction will be given in four progressive clinics as follows:

"Diagnosis and Radiography"
By John H. Longe .....Detroit
B. D. Welling .....Detroit

"Therapeutics"
By Archibald C. Thompson .....Detroit
Edward M. Slocomb .....Detroit

"Operative Technic, Equipment and Asepsis"
By Earl C. Barkley .....Detroit
Richard E. Patterson .....Detroit

"Filling the Root"
By Harold S. Slocum .....Detroit
Gerald F. Madison .....Detroit

The Diack Clinic Club

"The Importance of the Intangible Features of the Occlusal Surface"
Presenting a technic for the restoration of the occlusal surface, consistent with a new conception of the function of mastication, as indicated by recent studies in comparative dental anatomy.

By Alex Diack, Director .....Detroit
D. C. Arner .....Detroit
Louis Braun .....Detroit
Phillip A. Callahan .....Detroit
M. W. Frost .....Detroit
H. W. Kohn .....Detroit
M. H. Miars .....Detroit
O. C. Williams .....Detroit

"Complete Oral Diagnosis"

A complete oral diagnosis necessarily includes:

1. Knowledge of systemic conditions.
2. Careful clinical examination.
3. Correct radiographic examination.
4. Correlation of systemic, clinical and radiographic findings.

By H. H. Jackson .....Detroit
B. D. Welling .....Detroit
Carleton Fox .....Detroit
John H. Longe .....Detroit
George W. Christiansen .....Detroit

MINNESOTA

(Expected to furnish eleven clinicians)

"Exodontia—Post-Operative Complications"

Hemorrhage—over-surgery. Treatment of infection and other post-operative conditions.

By Henry B. Clark .....St. Paul

"Constructive and Destructive Pathological Processes in Teeth and Bone"

Illustrated with lantern slides.

By J. A. Heidbrink .....Minneapolis

"The Color Problem in Porcelain Restorations in the Mouth"

The science of chromatics as it is related to the subject, the technic of color selection, the problem of properly interpreting color in our porcelain restorations.

By William D. Vehe .....Minneapolis

"The Porcelain Veneer Crown"

The principles of tooth preparation for the crown; impression taking; cast and die making; matrix making; building and completing the crown.

By J. Raymond Gill .....St. Paul

"Practical Application of Dietetics for Children from the Dental Viewpoint"

Demonstration of practical dietetic diagnosis in dental office; demonstration of limitations and factors to be considered in dietetic changes suggested by dentist. What is Safety First in advising dietary?

By Philip R. Thomas .....Minneapolis

"Diseases of the Periodontium"

A chart and model clinic giving types, causes, and methods of treatment, past and present, of gingivitis, dental periclasia and ulcerative stomatitis.

By Harold J. Leonard .....Minneapolis

MONSON RESEARCH *and* CLINIC CLUB

"Fixed Reconstruction"

Attempting to show that the solution of the problem of fixed reconstruction is largely dependent upon the occlusal balance obtained. Also showing a balanced occlusion guide (B. O.G.) by which balanced occlusion may be obtained in fixed reconstruction. By the aid of complete clinic material this demonstration will proceed from diagnosis of mounted casts to the completed case.

By C. K. Bird .....St. Paul

"Removable Bridgework"

A detailed demonstration of the steps involved in the restoration of occlusal balance by the use of removable bridgework; showing that success depends upon balanced occlusion more than any other one factor. By the use of specially constructed casts we shall attempt to determine the degree of malocclusion; the establishment of a new occlusal line; the amount of opening necessary; a new mesiodistal relationship of mandible to maxilla. Also we shall show operative procedures for restoring abutment teeth to arc. Finally the importance of tooth anatomy as applied to occlusion in the fullest sense.

By O. DeForest Davis .....Minneapolis

"Full Denture"

A complete demonstration with the aid of clinic material and a specially devised lantern by which the clinic is supplemented with slides showing the detailed steps on a patient. We shall attempt to demonstrate a simple impression technic; the importance of obtaining the same relationship of masticating units on the articulating instrument as in the patient; correct set up of teeth and a waxing up with the idea in mind of permitting free enunciation in speech; finally the significance of obtaining a balanced occlusion, not only on the instrument but that it shall be balanced in the mouth as well.

By H. B. Washburn .....St. Paul

MISSOURI

(Expected to furnish nine clinicians)

"Anchored Dentures"

Spring relief, unilateral and bilateral cases using the cast clasp. Cast clasps in combination with inlays. Direct and indirect retention.

By George B. Scott .....St. Louis

"Work of the St. Louis Study Club"

Explaining the system of teaching followed in the different courses and presenting some of the technic as required by the different instructors.

By Otto J. Fruth .....St. Louis

"Oral Radiography"

Illustrating the necessity for thorough radiodontic examinations and discrimination in interpreting the evidence.

By Clarence O. Simpson .....St. Louis

"Technical Phases of Inlay Construction"

A demonstration of technical procedures to improve the efficiency of cast restorations.

By Edward E. Haverstick .....St. Louis

"Removable Bridgework, Replacing Lost Teeth Distal to Cuspids"

Unilateral and bilateral bridge, so constructed as not to bear strain on abutments. Practical cases will be shown that have been in service from 8 months to 3 years.

By Charles P. Grosby .....

"Root-Canal Technic and Treatment of Pulpless Teeth"

By W. A. Chamberlain .....St. Louis

(Additional names to be supplied)

"Instruments and Equipment with Demonstrated Technic, For Doing an Aseptic Root-Canal Operation"

Infection is the greatest factor causing failure in root-canal work. Second to infection is chemical and instrument trauma. Our clinic is to demonstrate methods for preventing these.

By Edouard M. Hall .....Kansas City

"Why Metal Bases Should be Swedged and How to Swedge Them"

The inherent qualities of expansion and contraction in metals make swedging of full bases imperative as a complement to the casting process. Simplicity of technic renders the omission of swedging entirely inexcusable.

By Dayton Dunbar Campbell .....
.....Kansas City

MONTANA

(Expected to furnish two clinicians)

NEW YORK

(Expected to furnish twenty clinicians)

"Orthodontia"

Plan of Diagnosis. The orthodontic treatment of deformities of the jaws and any irregularity of the teeth. Illustrated with a movable mandible and models with apparatus.

By V. H. Jackson .....New York City

"A Matrix for Amalgam Fillings, Making Possible the Correct Formation of Point of Contact"

A matrix in two parts. The filling is built against the proximate tooth and the matrix, being separable, is removed from beneath the contact point.

By John T. Hanks .....New York City

"Roentgen Interpretation of the Teeth, Jaws and Sinuses"

By Samuel M. Getzoff .....New York City

"A New Technic for the Taking of Dental Radiograms, Extra and Intra-Orally, by Predetermined Angulation"

Demonstration on patients of new technic for taking extra, intraoral, and stereoscopic radiograms by predetermined angulation. Radiograms thus taken can be exactly duplicated after any length of time.

By John F. Freund .....New York City

"Post-Operative Treatment of Mouth Wounds"

System of post-operative treatment based on drainage which practically eliminates post-operative pain and infection. Discussion of the mouth uses of anilin dyes of the Flavine Series.

By Arnott A. Moore .....Buffalo

BUFFALO STUDY CLUB OF DENTAL ENGINEERING

Dr. H. E. Reynolds, Director.

"Full Denture Technic, Complying with Individual Requirements of the Patient; Using the Adjustable Hanau Articulator"

Occlusal rims, Central Occlusion, Face Bow, Bites, Adjustment of Articulator.

By H. E. Reynold, Director.....Buffalo
E. J. Farmer .....Buffalo

"Face Bow Technic and Its Importance"

By H. E. Reynolds .....Buffalo

"Adjustment of Condylar Guidance in the Articulator, Condylar Guidance and its Effect Upon Balanced Occlusion"

By H. T. Gallager .....Buffalo

"Adjustment of Incisal Guidance in the Articulator. Overbite, Aesthetics, Phonetics. Incisal Guidance and its Effect Upon Balanced Occlusion"

By E. R. Melcher .....Buffalo

"Selection of Teeth; Cusp Height and its Effect Upon Balanced Occlusion; Correction Technic"

By George Snider .....Buffalo

THE BUFFALO PROSTHETIC CLINIC CLUB

Dr. Walter F. Chappelle, Director.

"Full Denture Technic, Valuable Aids to Better Denture Service"

"Salesmanship and Instruction to Patients—the Use of Psychology Makes Satisfied Patients Anxious to Co-operate"

By A. E. Wimmack .....Buffalo

"Ridge Relationship and the Use of a Face-Bow With an Arc and Adjustable Level Arm to Properly Place Models in the Articulator so that the Resulting Condyle Path Angles Will Approximate Natural Conditions"

By S. A. Gibson .....Buffalo

"A Simple Method of Checking Up Central Occlusion — Developing Aesthetics — Wax Protrusion Bites"

By A. J. McCarthy .....Buffalo

"Setting up Posteriors for Co-ordination and Balanced Bite with a New Anatomical Adjustable Articulator"

By W. F. Chappelle .....Buffalo

"Waxing, Flasking, Packing and Finishing, Stressing Many Short Cuts and Aids to Better Work. Regrinding for Minor Corrections"
By L. O. Starks .....Buffalo

"A Simple Correction Technic for Locating and Correcting Errors of all Kinds"
By Leon Algire .....Buffalo

UNIVERSITY OF BUFFALO CLINIC CLUB

Charles K. Buell, Director.

"Complete Technic for the Construction of a Hand-Carved Porcelain Shell Crown—By the Direct Method"

"Model and Drawing Exhibit with a Talk Upon the Advantages of This Crown Together with the Technic of Tooth Preparation"
By Daniel H. Squire .....Buffalo

"The Technic of Matrix Making and the Readapting of the Matrix Tooth After Biscuit Firing"
By Albert B. Cutler .....Buffalo

"Technic of the Application of the Porcelain to the Matrix, Especial Emphasis Being Given to the Blending of Colors and the Carving of Porcelain"
By Joseph L. Cleveland .....Buffalo

"The Firing of Porcelain, Both the Biscuit and the Final Firing, with the Removal of the Matrix and an Exhibit of Finished Crowns"
By C. K. Buell .....Buffalo

NEW MEXICO

(Expected to furnish two clinicians)

"(Title to be furnished)"
By R. E. Coulter .....Raton

NEW HAMPSHIRE

(Expected to furnish two clinicians)

NORTH CAROLINA

(Expected to furnish three clinicians)

"Technic on a Few Original and Practical Points in Dentistry"
By Charles L. Alexander .....Charlotte

"Plaster Mask of Adult Tubercular Mouth Breather, Showing Results of Operation, Restoring Nasal Breathing"
By J. N. Johnson .....Goldsboro

"A Method of Constructing a Cast Crown"
By L. G. Coble .....Greensboro

NORTH DAKOTA

(Expected to furnish three clinicians)

"Gold Inlay"
By L. I. Gilbert .....Fargo

"Tooth Form"
By H. C. Cooper .....Abercrombie

"Gold Foil"
By Fargo Study Club

NEW JERSEY

(Expected to furnish eight clinicians)

"Etiology of a Type of Orthodontic Cases" Showing how many cases of malocclusion develop due to the lack of early observance or knowledge of conditions by the family dentist.
By Charles S. Hardy .....Summit

NATIONAL CAPITAL

(Expected to furnish two clinicians)

NEBRASKA

(Expected to furnish five clinicians)

OHIO

(Expected to furnish 50 clinicians)

TOLEDO CLINIC CLUB

"Gold Castings, Indirect Method"
"Cavity Preparation"
By L. L. Barber and W. J. Dierks.....Toledo

"Impression and Bite"
By W. S. Graves .....Toledo

"Making and Articulating Amalgam Models"
By J. W. Travis .....Toledo

"Making Wax Pattern"
By W. J. Hartshorn and R. H. Vollmayer .....Toledo

"Investing, Elimination of Wax, Casting"
By R. K. Wood and W. H. Hisey .....Toledo

"Polishing, Cementing and Finished Work"
By A. H. Breitenwischer .....Toledo

"Improved Amalgam Technic"
By G. F. Bell .....Conneaut
S. W. Brown .....Ashtabula

"A Combination of Three-quarter Crown and Inlay Bridge Attachment with Tooth Form Dummy, Porcelain Cervical"
By Frank C. Starr .....Columbus

"Wrought Clasps in Removable Bridge and Partial Dentures"
By M. E. Niswonger .....Dayton

"Chemistry and Physics of Alloys"
By Mr. Selner .....Cleveland

"Fuller Lower Denture"
By M. H. Stewart .....Findlay

"Full Dentures"
By Cincinnati Clinic Club (10 men participating)

CLEVELAND SCHOOL CLINIC CLUB

"Amal Restoration, Deciduous Teeth"
By Guy S. Lerch .....Cleveland
W. M. Goodwin .....Cleveland
F. E. Miller .....Cleveland

"Surgical Clinic" (Mt. Sinai Hospital)
By M. B. Galvin .....Cleveland

"Crown and Bridge Technics"
By F. G. Behmlander .....Cleveland

"Operative Technics"
By E. W. Mullenkopf .....Cleveland

"Surgical Clinic" (City Hospital)
By P. J. Aufderheide .....Cleveland
M. L. Drake .....Cleveland
Will Nichols .....Cleveland

OKLAHOMA

(Expected to furnish five clinicians)

"A Method of Constructing a Soldered Base Porcelain Crown"
By Wilbert J. Scruton ....Oklahoma City

"Original Technic for Lower Denture"
Demonstrating on anatomical specimen, special fitting of tray and taking of impression, showing area fitted and fitted case.
By W. T. Jacobs .....Muskogee

"Exodontia"
By J. B. Jenkins .....Oklahoma City

"Root-Canal Technic"
Reasons for combined use of sodium potassium and sulphuric acid in opening root-canals. Clinical demonstration of a complete technic, including cultural methods and electrolytic medication.
By A. L. Walters .....Tulsa

"(Subject to be supplied)"
By L. M. Doss .....Oklahoma City

"(Subject to be supplied)"
By Charles Hess .....Idabell

OREGON

(Expected to furnish three clinicians)

"Considerations in Treatment of Cases Requiring Pronounced Development"
By E. M. Griffin .....Portland

PENNSYLVANIA

(Expected to furnish 17 clinicians)

THE DENTAL CLINIC CLUB OF PHILADELPHIA

"Removable Restorations"
1. Cavity preparation for inlays, etc.
2. Making wax patterns and skeleton patterns.
3. Impressions, sectional methods.
4. Making different types of attachments.
5. Assembling.

By W. J. Robinson, Director .....
..... Philadelphia
A. Kassab .....Chester
Leon Halpern .....Philadelphia
H. D. Shields .....Philadelphia
J. H. Yearick .....Philadelphia

"Impressions of Edentulous Mouths Combining Correctible Plaster with Correctible Compound"
With suitable casts and impressions the various steps necessary for securing full upper and lower impressions will be considered in detail. Both correctible plaster and correctible compound will be employed in the same case.
By M. M. DeVan .....Philadelphia

"The Technic of Amalgam Work With Special Reference to the Use of Cement and the Matrix"
Preparation of cavity for amalgam; Introduction and packing of amalgam; Trimming and carving to contour and accommodation of occlusion.
By S. Blair Luckie .....Chester

"Fundamental Principles of Orthodontia for the Beginner"
Analysis of the troubles which beset the beginner; Technic for construction of the appliances; Review of typical cases of malocclusion; Description of treatment.
By Andrew Francis Jackson .....
..... Philadelphia

"Pulp Conservation"
A germicidal treatment of the infected dentin of deep-seated cavities, particularly of the six-year molars of children. Showing method of making medicament, and it application to infected cavity.
By Andrew J. Seeler .....Philadelphia

"Exodontia Problems"
Various methods of removing teeth as indicated by their shape, size, relation to adjacent structures and other determining factors.
By Agnew Irwin .....Philadelphia

"Interesting Oral Surgical Cases"
Lecture will cover the diagnosis and treatment of surgical conditions of the jaws. Cysts—osteomyelitis of mandible—impactions within the orbit—tumors, etc. Alveolar abscesses with septicemia.
By James R. Cameron .....Philadelphia

"A Simplified Technic for Bridgework with Porcelain at Gum Contact"
Using a facing ground to shape and polished by a process that renders a glaze in smoothness that cannot be distinguished by magnifier from oven glaze.
By John G. Logan .....Portage

"A Method of Cast Clasp Technic for Partial Restorations"

Selection of cases, impression technic, making of casts and materials used, waxing of cases, investing. Alloys used and their treatment. Heat treatment of casting. Polishing and finishing of cases.

By Albert S. Mulford .....Philadelphia

"Local Intraosseous Anesthesia"

A simple and safe method of securing immediate and complete anesthesia of individual teeth for extraction, cavity preparation and pulp removal.

By J. Wayne Martin .....Uniontown

"A Simplified Wax Pattern Technic"

A direct method for simple and compound inlays, three quarter crowns and incisal angle restorations. The patterns will be carved on a manikin supplied with ivory teeth.

By E. Bruce Clark .....Uniontown

"A New Principle in the Removal of Fractured Roots"

The removal of fractured roots is a delicate operation that requires delicate instruments handled in a delicate way—the principle is new and the application simple—the time to remove a fractured root is at the time of the original operation and the post operation pain is directly in proportion to the amount of traumatic injury produced.

By Fred D. Miller .....Altoona

"Waxing, Investing and Casting"

The manipulation and working ranges of wax and investing materials—the properties and working ranges of casting gold.

By Emory C. Thompson .....Warren

PROSTHETIC RESEARCH CLUB OF PITTSBURGH

J. H. R. McCampbell, Secretary.

"Full Denture Technic—Monson Spherical Plane of Occlusion"

A two table clinic, giving the different stages in the construction of a full denture case, using the Monson instrument. First table: Impressions, Models, Face Bow and establishing normal central occlusion. Second table: Mounting on instrument and setting up teeth.

RHODE ISLAND

(Expected to furnish three clinicians)

SOUTHERN CALIFORNIA

(Expected to furnish eight clinicians)

"A Full Upper Continuous Gum Denture One One-Thousandth Platinum Foil"

By Charles O. McBean .....Los Angeles

"A Semi-direct Gold Inlay Technic"

By Nye White Goodman .....Los Angeles

"The Principles Involved in the Treatment of Mutilated Natural Dentures, Particularly Where Bridgework is Necessary"

By B. B. McCollum .....Los Angeles

SOUTH DAKOTA

(Expected to furnish three clinicians)

"Fractures of the Mandible"

Illustrated lecture with Slides of Actual Cases from Oral Surgery Service of Cook County Hospital.

By Ralph H. Fouser .....Chicago, Ill.

"Prosthesis"

By Robert Jasman .....Sioux Falls

SOUTH CAROLINA

(Expected to furnish three clinicians)

TEXAS

(Expected to furnish six clinicians)

"Restorations in Cases of Pyorrheal Absorption with Baked Porcelain Roots, Tips and Extensions, Using Saddle-Back Teeth and Long Pin Facings"

Saddle-back teeth are used by baking extension on gum end, providing glazed porcelain next to gum tissue and porcelain grinding surface, no gold showing. Pins on facing bent at 45 degrees giving more strength of attachment and allowing replacement of baked roots in case of breakage.

By W. O. Talbot .....Ft. Worth

"Appliances for Treating Fractures of the Maxillae and Mandible"

Showing skull with various appliances adjusted for the reduction of fractures of both maxillae and mandible.

By J. M. Murphy .....Temple

"Wrought Clasps"

Round and one-half round wrought wire clasps for attachments on removable and bridges and partial dentures.

By E. L. Knox .....Dallas

"Method of Making Pins for First Bicuspids (Upper)"

The use of half round wire for the making of double pin for upper first bicuspids.

By Robert L. Wheless .....Dallas

"Special Pyorrhea Instruments and How to Make Them—Polishing Tooth Roots with Steel Instruments in Pyorrhea Treatment"

Describing methods of using special types of instruments and demonstrating how to shape, temper and sharpen them—practical demonstration on extracted teeth.

By Julian Smith .....Dallas

"Wire Clasps and Wire Framework for Partial Plates"

A simple and practical application of the wire clasp and frame work reducing bulk of vulcanite and getting stabilizing pressure not gotten from the gold lingual and palatal bar.

By J. O. Hall .....Waco

WEST TEXAS DENTAL SOCIETY

M. R. Garrison, Chairman.

"Group Clinic on Removable Bridgework and Partial Dentures"

(Names of Clinicians to be furnished)

TENNESSEE

(Expected to furnish three clinicians)

"Orthodontia"
By Oren A. Oliver .....Nashville

UTAH

(Expected to furnish three clinicians)

VERMONT

(Expected to furnish two clinicians)

VIRGINIA

(Expected to furnish five clinicians)

"Construction of Bilateral Gold Partial Dentures by the Indirect Method"

Impression with modeling compound and plaster in sections; impression boxed; amalgam packed in teeth ready for stone cast; stone and amalgam model; plaster bite; plaster bite packed with amalgam; model Articulated and set up in wax; exhibits showing the removal of wax for investing; finished case. Six cases completed showing principles of breaking stress on clasped teeth—three upper and three lower.

By M. B. Rudd .....Richmond

"Art in Dentistry"

A presentation of the application of art in dentistry, its necessity and advantages; dealing particularly with the anatomy of individual teeth and their relative positions.

By Herbert Cohn .....Richmond

WISCONSIN

(Expected to furnish nine clinicians)

"Spring Pressure in Orthodontics"

Models with appliances showing the method by which these springs act.

By A. C. Gifford .....Oshkosh

"Fractures of Mandible and Maxilla"

Some fundamental factors in their reduction, importance of x-rays in diagnosis, simple appliances and their practical application. Clinic to be illustrated with x-rays, models and appliances.

By Roy S. Hopkinson .....Milwaukee

"Types of Fixed and Removable Bridgework"
By O. G. Krause .....Milwaukee

"Factors Concerned in the Inception of Periodontal Disturbances and Ideas as to the Prevention of Recurrence"
By Elbert J. Weaver .....Milwaukee

"The Obturator, Its Construction and Application in Connection with Cleft Palate"
By Carl B. Case .....Milwaukee

SUPERIOR CLINIC CLUB

Archibald G. Fee, Director .....Superior

WASHINGTON

(Expected to furnish six clinicians)

WEST VIRGINIA

(Expected to furnish three clinicians)

"Porcelain Shoulder Crowns"

Preparation; adapting foil on teeth to be crowned; packing and the fusing of porcelain; staining of finished crown when necessary.

By L. E. Lawson .....Williamson

"Surgical Preparation of Soft Tissues to Receive Dentures"

A presentation by means of models, in plaster, showing teeth in position before extraction. Operation on soft tissues, chiseling, curetting, filling, etc., of alveolar processes, removal of teeth—suturing flap after treatment.

By Howard W. Burnett .....Fairmont

WYOMING

(Expected to furnish two clinicians)

SECTION ON RESEARCH

"Experimental Results of Planting Infected Teeth in Animals"

A demonstration of the effect of dental infection as expressed in tissue lesions.

By Weston A. Price .....Cleveland, Ohio

MOUTH HYGIENE SECTION

Clinics in this section to be given in the Oral Hygiene Exhibit open during the entire meeting.

(a) Exhibit of Lantern Slides for use in talks to the public on Oral Hygiene.

(b) Catalogue of slides for use of profession in arranging lecture and selecting and obtaining slides.

This exhibit arranged by Oral Hygiene Committee of the Canadian Dental Association, outlines a scheme whereby the state and local societies and the individual dentists may work in close co-operation in the important matter of Oral Hygiene lectures and propaganda.

By Wallace Secombe .....Montreal, Canada

PARTIAL DENTAL SECTION

1. Preparation to show that Spherical surfaces allow balanced relation in all positions.
2. Spherical bite method showing central occlusion and range of occlusion.
3. Preparation showing relation of curve of Spee to condyle path and the depth of cusp and overbite.

4. Preparation showing that central occlusion may be established at any point within the range of occlusion by proper arrangement of inclined planes.

By J. W. Needles .....Pueblo, Colorado

1. Use of transfer, its significance.
2. Mounting casts.
3. Checking same.
4. Diagnosis, showing each step in "positioning tie" and "balanced occlusion guide" technic.

By C. K. Bird and Group .....
.....St. Paul, Minn.

1. Presentation of an abutment designed to combine the practical principle of the cast abutment with the aesthetic principle of the Porcelain Jacket Crown.
2. The form of the cast abutment to give the approximal attachment to the pontic, combining with it a form for the reception of a Porcelain Jacket Crown, concealing all display of gold.
3. Preparation of the tooth.
4. The making of the wax impression in a copper band.
5. Formation of the wax model embodying the detail form for the cast abutment.
6. Fitting the abutment also giving the proper alinement to the pontic attachment.
7. Completing the bridge and the application of the Porcelain Jacket crown operation, adding to the fixed bridge method the highest esthetic principle.

By J. E. Argue .....Seattle, Washington

Removable Bridgework

The Fundamentals Underlying its Application in Partial Restorations.

1. The radiographic survey of Alveolar Ridge.
2. The application of the principle of broken stress.
3. Saddle adaptation.
4. Esthetics, color, arrangement, etc.
5. The handling of malposed teeth.
6. Occlusion.

By B. B. McCollum, Director .....
.....Los Angels Cal.
D. W. McLean .....Los Angeles
H. B. Holcomb .....Los Angeles
G. M. Hollenback .....Los Angeles

Clinic Outline

Demonstration by a group of four or five men showing all of the steps involved in the diagnosis and reconstruction of a case of malocclusion resulting from loss of teeth. The above demonstration will include the technic of actual bridge construction, as well as showing finished cases restored to full occlusion.

Preparations on the various types of teeth for bridge abutments, preserving vitality. The application of dental anatomy as applied to the various preparations.

1. Preparations on various types of centrals and laterals. (A) Ovoid. (B) Square.
2. Preparations on cuspids. (A) Upper. (B) Lower.
3. Preparations on bell shaped teeth. (A) Three quarter veneer on upper and lower bicuspids and molars. (B) Inlay Preparations.
4. Full crown veneers. (A) Lower bicuspids. (B) Upper and lower molars.

By T. W. Maves .....Minneapolis, Minn.

Fixed Bridgework

Problems and Important factors involved in manipulation of wax, investing process, carbonization and elimination of wax in the burning-out process, casting and casting gold.

To include:

1. Properties of wax.
2. Working ranges of wax.
3. Location of wax.
4. Getting the wax pattern.
5. Annealing the wax.
6. Removal of wax pattern.
7. Coating of wax.

Investment:

1. Properties of investment.
2. Working ranges of investment.
3. Proportions of investment and water.
4. Spatulation of investment.
5. Time to allow for crystallization.
6. Heating of investment.
7. Properties of casting gold.
8. Heating of gold.
9. A few fundamentals pertaining to Metallurgy.

By Emory C. Thompson, ...
.....Warren, Pa.

OPERATIVE DENTISTRY SECTION

Gold Inlay Technic

A. Finishing of cavity preparation. Cavity protection. Waxes, wax pattern and making and finishing.

B. Contour and contact.

C. Investment, Spatulation, application and setting.

D. Dissipation of wax, rapid and slow method. Temperature range.

E. Blowpipes and casting; oxygen gas; oxygen and hydrogen; hydrogen and air; hydrogen, gas and air.

F. Golds.

G. Finishing.

H. Setting.

By V. T. Nylander and Assistants .....
.....Chicago, Ill.

THE CLEVELAND SESSION

A REPORT FROM THE GENERAL CHAIRMAN LOCAL ARRANGEMENTS COMMITTEE

On behalf of the Local Arrangements Committee, I wish to extend a cordial welcome to the members of the American Dental Association to come to Cleveland in September to attend what we believe will be the most profitable and largest dental meeting ever held.

The Local Committee of Arrangements at Work.

In making this statement we do not wish to cast reflections upon any previous meeting, but realize that in the natural evolution of the progress of dentistry, if such were not the case, we would feel derelict in our duties and responsibilities. In all probability and by the natural trend of the times, the 1924 meeting should surpass this one. No doubt, each meeting marks a distinct epoch in the history of dentistry.

This year the Local Arrangements Committee was enlarged from eight members to fifteen. The members of the committee were all selected by the Cleveland Dental Society, recommended to the president and trustees of the American Dental Association and by them officially appointed. The members were chosen for their

peculiar fitness to the place where they were to serve and the work thus far has proven the feasibility of such a plan. Every man has displayed unusual ability and efficiency and we believe the American Dental Association will have the best managed meeting in its history. Practically all the important arrangements for the meeting have been completed.

The new Public Auditorium has been secured for the principal place of meeting, where it is intended to hold approximately eighty per cent of the activities. The hall for the dental exhibits will be ideal and will accommodate a larger number than ever before. The character of the exhibits will be of the best and promises to be of great educational value.

Fortunately the location of the large hotels is most advantageous. They are grouped in the down town district and within ten minutes' walk of the Public Auditorium. The Cleveland Hotel Men's Association has cooperated with us to the fullest extent. There will be no advance in hotel rates. They have agreed to place at our disposal sixty per cent of the room capacity, which will make available approximately forty-five hundred rooms in the down town district. Add to this number the available sixty-five hundred rooms. This we believe will furnish accommodations for all in attendance, although it will be necessary in most instances for two or more people to occupy the same room.

The hotels have further agreed to place at our disposal without cost all halls and meeting rooms, the Hollenden agreeing, where Headquarters of the meeting will be established, to give over the entire mezzanine floor.

Definite arrangements have been made for all meetings in so far as such arrangements have been requested. A master chart is in use which will show definitely the time and place for each and every meeting, and when this is completed all confusion in regard to meeting places will be eliminated.

A folder containing a reservation blank and definite information regarding the hotels, such as rates, headquarters for various sections, and a diagram showing locations of the various hotels with respect to the Public Auditorium, was printed by the Hotel Men's Association and placed in the hands of the Committee for distribution. These have been widely distributed through the Publicity Committee and will be copied and printed in several of the dental journals. The Committee will cooperate with the hotels in an endeavor to keep all reservations straightened out so that there will be no confusion or misunderstandings in this respect.

The Entertainment Committee has practically completed its program which will include such entertainment as is customary for the general sessions, for the guests, for the ladies in attendance and for the general membership. The latter will be given in Keith's Palace Theatre, reputed to be the finest theatre in the world on Thursday evening, September 13. This entertainment promises to be quite a unique affair, combining a scientific program as well as an interesting and enjoyable time. The theatre will accommodate thirty-eight hundred. It will therefore be advisable for those who wish to attend this occasion to secure tickets upon arrival.

The Reception Committee will function during the entire meeting, will welcome guests, friends and members to Cleveland and will attempt to see that everybody is happy, contented and well satisfied.

The Information Committee will inaugurate a very definite and complete program and will endeavor to supply information pertaining to the meeting. Booths will be established at the Public Auditorium and at each of the large hotels which will make it convenient to secure any and all desired information.

The Committees on Transportation, Registration, Program Clinics and Illustrated Clinics have all formulated their policies and we are assured that all of the work concerning these committees will be most efficiently performed.

The Publicity Committee has been very active; has endeavored to secure all information of interest regarding the meeting and to disseminate the same through various sources. The Publicity Campaign was inaugurated several months ago and has been consistently carried out since then. This committee was active in developing the seal which carries the slogan of the meeting, namely, "Prevent," "Conserve," "Progress." This we believe to be the most appropriate and one which needs no apology. The Committee also designed the beautiful cover page which is being used for the Special "Cleveland Number" of the Journal of the American Dental Association.

The badges and membership buttons to be used at the meeting will be rather a unique feature. There will be a special badge which will have a name plate, with a ribbon, on which will be suspended a pendant. These badges will be distributed to the officers, all committees, delegates and guests, the color of the ribbon and printing upon same indicating the respective office, committee, etc.

The membership button will be of celluloid, one and one-fourth inches in diameter and a duplicate of the inside circle of the original seal, the slogan being omitted.

The visitor's badge will be the same design, of a different color and will have a small ribbon, on which will be printed "Visitor."

The exhibitor's button will be of the same design, of still another color, and will have attached a ribbon on which will be printed, "Exhibitor."

For the Ohio members of the American Dental Association the regular membership button will be used, with a ribbon attached, on which will be printed, "Ohio."

The color of the ribbon on the badge worn by members of the Cleveland Committee, of which there will be more than one hundred, will be white, with the word "Committee" across the center. This will be the only white ribbon, therefore, the Cleveland men will be easily distinguished.

Another special feature to be inaugurated will be the publication of a daily bulletin. This will be rather elaborate and will contain many things of interest to the members in attendance. There will be cartoons, current events, registration, information, and various other things. The first copy of this bulletin will probably be mailed to each member of the Association two or three weeks previous to the meeting begining Monday and concluding with Friday's issue.

In conclusion may I again call your attention to the slogan "Prevent," "Conserve," "Progress" and offer the suggestion that in the light of the present knowledge and progress in dentistry, no member can afford to miss this great and epoch-making meeting.

F. M. CASTO, *General Chairman,*
Local Arrangements, Cleveland, Ohio.

A WELCOME TO CLEVELAND

The importance of an association like the American Dental Association, which has as one of its objects the gathering of exhaustive and scientific research in which but few men ordinarily are able to engage, and through its members to add largely to the store of general knowledge by disseminating the results of their special and expert labors, cannot be over-estimated.

What the busy practitioner needs is that someone should, to an extent, do various specialized work for him. It is absolutely necessary that he should get the concrete results of the labors of others, and that those results should be placed before him in an attractive and easily assimilated form. To accomplish this the officers and committee men have been laboring continuously for many months.

One cannot be expected to assimilate all that the completed program offers. The world has profited enormously by the tendency of men to confine their attention to particular subjects and to thoroughly master them.

Make your plans for the summer to include a visit to the Cleveland meeting and we will help you to enjoy the specialized labors of others in that field most attractive to you.

On behalf of our Hospitality Committee I am extending to you a most earnest and cordial welcome.

It is also expected that you notify us of your time of arrival and route of entry. We are at your service from the time of arrival until after the meeting as long as you can stay with us. Notices may be sent to

J. F. STEPHAN,
Chairman, Hospitality Committee,
Hollenden Hotel, Cleveland, Ohio.

OPINIONS OF SIXTEEN PROMINENT DENTISTS

(Note—The following opinions concerning the great meeting of the American Dental Association to be held in Cleveland, September 10-14, are well worth reading. The judgment of these men is regarded as some of the best in this country.)

OPINIONS

You can't prevent having a big meeting. It should be the largest and best yet held.

JOHN P. BUCKLEY, *President.*

I fully expect the attendance at the American Dental Association Meeting at Cleveland, will break all records.

W. A. GIFFEN, *President-Elect.*

The more I think of the splendid way in which everything is lined up for the great meeting next September, the more I am impressed with the fact that Cleveland will stage a meeting that will establish in dental history a precedent that will be hard to excel in many years to come.

OTTO U. KING, *Secretary.*

A preliminary survey indicates that the Cleveland meeting will be the largest and most scientific dental meeting ever held.

Arrangements and accommodations for those in attendance will be satisfactory in every respect.

F. M. CASTO,
Chairman Local Committee.

I believe our steadily reviving economic and business conditions warrant the hope that the meeting of the American Dental Association in Cleveland will, because of the central location of Cleveland and the exceedingly favorable season of the year which has been selected for the meeting, and because of the ever-growing interest in the dental profession in the American Dental Association, which has been shown by the greatly increased member-

ship attained in 1922—that it will be a bigger, better and more helpful meeting for those who attend it than any previous meeting.

THOMAS B. HARTZELL, *Past President.*

Of course, we are going to have a big meeting at Cleveland—the biggest ever. I'll take off my coat and help in every way.

C. N. JOHNSON.

The quality of the meeting, I am satisfied will be of high order. There is probably no body of men in the United States which has improved in quality more than the members of the dental profession in the last decade. It may not be apparent to all, but I am convinced that they have greatly improved in judgment. If anyone doubts it, just tell him they have selected Cleveland, for their next place of meeting.

As to how many of these good fellows will be there, I think it is safe to say there will be seven to eight thousand.

TRUMAN W. BROPHY.

Considering the importance of Cleveland as a focus of dental affection I do not see why there should not be an inflammatory outburst of dental professional activity in the coming meeting that will surpass any previous manifestations of constructive dental activity in our history. If my wish can be regarded as the parent of the thought, the success of the meeting is already assured.

EDWARD S. KIRK.

I have never attended a meeting of the American Dental Association without learning something which has been of importance to me in practice and I certainly expect to learn more than ever at the great meeting projected for Cleveland.

R. OTTOLENGUI.

My opinion of the size and quality of the meeting of the American Dental Association in Cleveland, September next would say that I do not know what the program will be but from what I know of John P. Buckley, the President, and his associates in office I know that the program will be one of the best that has ever been presented at any meeting, and from what I know of Cleveland and the live bunch of fellows that are in charge of the Local Arrangements I predict the largest meeting that the Association has ever held.

J. V. CONZETT.

Cleveland is admirably situated to make it convenient for a large number to be present, and the time of year should not interfere with the vacation periods of the members. Local arrangements are splendid in every way and there should be no difficulty in properly staging all of the activities of the Association. The profession in Cleveland has had experience in conducting large meetings, and I feel certain that everything possible will be done for the convenience and comfort of those present. From what I have learned, I know that the quality of the papers, clinics, etc., will be of the very highest order, and should attract those who are interested in keeping up with the procession.

H. J. BURKHART.

In my opinion the meeting at Cleveland should be the largest and best organized in the history of the American Dental Association. With the knowledge gained from past experience in handling the Association in 1912; with the accessibility of Cleveland; with the hotel and auditorium facilities you have, there is no reason why the Cleveland meeting should not be an epoch-making one.

THOMAS P. HINMAN.

According to my way of thinking, considering the matter from every possible angle; the central location, railroad facilities, local accommodations, the improvement of dental business conditions generally and financially, it seems to me that the coming meeting of the American Dental Association in Cleveland, Ohio, September 10 to 14 inclusive, is predestined to be by far greater in the point of attendance than any previous meeting.

CARL D. LUCAS.

It is my opinion that Cleveland's location geographically, being so near the center of dental population; her accessibility from all parts of the U. S. A., her unequalled facilities for housing and conducting a great meeting, should make this the banner meeting in the history of the Association.

D. C. BACON.

I have taken some pains to look over the personnel of the various committees, and I cannot help but feel that a program will be offered which cannot fail to attract a large attendance. Without doubt Cleveland is one of the best convention cities in this country, and with the facilities you have at your command the next meeting should go into history as one of the greatest ever held. The spirit of research and investigation is abroad in the dental profession, and with a good program assured everybody will want to be there.

HENRY L. BANZHAF.

Season, location, pep, and convention facilities, together with greatly increased membership of the American Dental Association should make the Cleveland meeting the greatest to date both numerically and professionally.

J. F. BIDDLE.

HOW TO REACH CLEVELAND

Plan your vacation so you can attend the meeting of the American Dental Association in Cleveland. You will enjoy cool, invigorating September weather after August's heat.

Cleveland, situated on Lake Erie, is one of the main ports on the greatest chain of inland lakes in the world.

Men from the West can arrange their itinerary by the way of Duluth, thence across Lake Superior, through the great locks at the Soo, down St. Mary's River and Lake Huron, Lake St. Clair, beautiful St. Clair flats and Detroit River to Lake Erie.

Stop-overs can be arranged along this inland water route which will enable you to see some of the most beautiful scenery North America has to offer, Mackinac Islands and Georgian Bay.

Those coming from New York and other points East, can travel all the way to Cleveland by water, with only three short connecting links by rail. This route includes Hudson River passing the Palisades and Catskills to Albany, north to picturesque Lake George and Lake Champlain, nestling in the heart of the Adirondack Mountains, affording scenery which is not surpassed elsewhere in the United States.

From Lake Champlain, a short jump by rail brings the traveler to Montreal, a city of many interesting sights.

From Montreal, the trip down the wonderful St. Lawrence River past the Thousand Islands, brings to you scenery never to be forgotten. Then, across Lake Ontario, touching Toronto and Buffalo with stop-overs along the route, including Niagara Falls, which we all know as the largest waterfall in the world. From Buffalo, we approach Cleveland via Lake Erie.

No one can know the natural wonders of their country without having seen this chain of beautiful waterways. From Cleveland, numerous short side trips by water can also be arranged. Cleveland is readily accessible by rail from East, West and South.

Members and their families wishing to tour to Cleveland, will find splendid roads leading there from East, West and South.

MOUTH HYGIENE AND PUBLIC INSTRUCTION

The Local Committee thought so favorably of the Health Exhibit at Los Angeles last year that they gave us the best space in Cleveland, the front of the main floor of our new Auditorium building. Fourteen thousand square feet have been allotted and possibly more will be requested. The Health Exhibit will cover all scopes of educational dentistry. Everyone interested in educating the public should plan to spend considerable time at the Exhibit.

If you want to start a dental clinic in your schools, settlement houses, Y. M. C. A.'s and factories you can learn all the details and many other interesting facts at this exhibit.

The list of contributors that have already been provided space to exhibit include societies from the following states: Massachusetts, New York, Ohio, Pennsylvania, West Virginia, Indiana, Michigan, Illinois, Wisconsin, Minnesota, California, Mississippi, North Carolina and Louisiana.

We also expect exhibits from the Forsyth and Eastman Dental Dispensaries, The McDowel County, West Virginia Clinics, City of Cincinnati, The Child Health Demonstration of the National Health Council, The National Association of Industrial Dental Surgeons, The National Cash Register Company, Metropolitan Life Insurance Company, The National Lamp Company, Cleveland Mouth Hygiene Association and about ten local child helping organizations that are willing and anxious to exhibit, because of their appreciation of the value of Mouth Hygiene in the work they are doing. Dr. Weston A. Price will have a very interesting exhibit of work on Dental Research as will also the Dental Hygienists of California.

The Committee on Information will have booths and attendants at the Public Hall and at all of the down town hotels. Our work will be greatly assisted by the daily news which will be issued each day of the convention. Members of the Committee will be prepared to give out information continuously and we hope to be able to answer every inquiry.

CLINICS

The Clinic Program will be the largest and most elaborate ever presented at a National meeting. There will be *Individual Clinics* to satisfy the man who likes the old-fashioned personal contact and conversation type of clinic.

There will be *group clinics* in which each man will with great pains demonstrate a particular step in technic. This type of clinic is decidedly educational, presenting the most approved methods in technic in an ideal manner. There will be *surgical clinics* for those interested in operative procedures under anesthesia. Every technical procedure in dentistry will be represented on the Clinic Program. Two half days of clinic program, Thursday afternoon and Friday morning, will give ample opportunity for all in attendance. The clinics will be so arranged that each half day will present half of the group of clinics on each subject. Some of the clinics will be designed to demonstrate the papers presented in the Sections.

Eighty-five per cent of all knowledge is acquired through the eyes; therefore, come and enjoy the Clinic Program and carry home a fund of ideas that will be helpful in practice.

The Clinic Program, with the exception of Surgical Clinics, will be held in the six million dollar ($6,000,000) Auditorium. The most wonderful lighting system known is in this building. Every dentist will enjoy the play of colors that flood the Auditorium on appropriate occasions. This great Auditorium is delightfully located near the banks of Lake Erie, some seventy feet above the water level, overlooking a most interesting harbor where iron ore, limestone and coal meet. This auditorium is a part of the famous Mall which Cleveland has been developing during the past two decades.

Cleveland is far enough West to appreciate Western hospitality, and we assure you a happy and interesting week—September 10 to 14, 1923.

MOUTH HYGIENE OR SCHOOL DENTISTRY

If you are interested in Mouth Hygiene or School Dentistry, come to Cleveland, September 10 to 14. An excellent exhibit relating to school dentistry will be here for your study. Cleveland is one of the historic centers of the Mouth Hygiene movement. In Cleveland the Marion School experiments were conducted in 1910-11. In Cleveland the Board of Education has conducted Mouth Hygiene Dispensaries in the school buildings for seven years. In Cleveland Mouth Hygiene work has been carried on in Municipal Health Centers for six years. In Cleveland a Surgical Dental Dispensary has been conducted at City Hospital for patients sent from our Mouth Hygiene Dispensaries. In Cleveland the Tuberculosis Sanitarium has had full time dental service for six years. Cleveland has supported an active Mouth Hygiene organization for eleven years. Let us show you our clinic work, and let us tell you of the great change in the number of children receiving dental care in the last ten years. Let us tell you how we finance the service and let us show you how we conduct a Mouth Hygiene Dispensary.

ILLUSTRATED CLINICS

Every member of the Committee on Illustrated Clinics has pledged himself to give his utmost attention to the needs of the essayist or clinician requiring the use of a lantern to illustrate his subject.

To facilitate the efficient distribution of the lanterns, a large chart is being prepared, showing the number of lanterns in use, when and where being used. This chart, which will hang at Headquarters, Public Auditorium, will show at a glance where the lanterns are situated. It will also show the name and hotel room number of the essayist or clinician using a lantern.

A member of this Committee will be in charge at each Section's Headquarters to see that the lantern is ready when needed. He will also see that the slides are properly received and returned to the essayist without breakage or loss of time, thus making it possible to perform our share in making this Cleveland meeting a big success.

REGISTRATION AT THE MEETING

The registration for the Cleveland Meeting will be handled in a newer, better and more efficient manner than any previous meeting. Experts on this problem have been consulted and a plan has been formed whereby much of the confusion and delay usually accompanying the registration of eight to ten thousand people has been eliminated.

Each visitor will be given a card made out for him. These cards will be handled by experts who will be able to give out information very rapidly. The facilities for registration at the hall are ideal and very little of the time of the members will be taken in the task of registration.

This department will provide a daily list of all registered and have it classified by states. This list will be published and also provided for the use of the Information Committee. It will then be a simple matter to find out if a friend whom you have not seen for years is in attendance or not.

ENTERTAINMENT COMMITTEE—AMERICAN DENTAL ASSOCIATION

The Entertainment Committee, in behalf of the dentists of Cleveland and Ohio, are preparing a cordial welcome for our thousands of visitors who will be here when the members and ladies of the American Dental Association come to the convention September 10.

All are enthusiastic in their desire to extend the famed hospitality of the Old Western Reserve and so a program is being perfected which will keep all busy playing when not working.

Our first desire is to have every visitor see our wonderful city and its beautiful homes. Cleveland is reputed to have a greater percentage of home owners in proportion to the population than any other city in the country. Many of its fine residence districts resemble parks. We also have one of the finest park systems to be found in any city in the country. Cleveland is built on the shores of Lake Erie,

one of the great inland seas, and Cleveland is one of the greatest ports in the world, when calculated by the number of tons of cargo unloaded from ships. It is one of the great ports for receiving iron ore and shipping coal. It is famed for its manufactures and comprises thousands of factories producing every conceivable article of commerce from clothing to suspension bridges.

Unique entertainment features have been planned, but the greatest treat in store will be the "dentists' night" at Keith's Palace Theatre, the most handsome and best equipped theatre in the world. The entire theatre has been chartered for the American Dental Association for Thursday evening of the convention week and the dentists will own and operate this

Euclid Beach Amusement Park.

wonderful house from cellar to garret on that occasion. The entire vaudeville show, especially arranged for us, will be ours, as well as every other feature of the theatre. Every seat in the house, three thousand eight hundred (3,800) in all, will be occupied by dentists and their ladies.

Automobile and sight-seeing trips have been arranged and a special expedition for the ladies is being perfected; we will keep this a secret, but the ladies will remember Cleveland and this trip for many a day.

The opening of every general session will be featured by a brief but snappy entertainment number, to put all in good humor and in a receptive mood for the scientific program to follow.

The wonderful organ in the Cleveland Auditorium will be played by a Cleveland dentist and other Cleveland dentists will contribute their parts to these entertainments.

There are many of the finest restaurants and cabarets in the country to be found in Cleveland and so our guests can look forward to much work at the convention and much pleasure during their leisure.

The motto of the Entertainment Committee is: "A little folly now and then is relished by the wisest men."

SUGGESTIONS FROM HALLS AND HOTELS COMMITTEE

The hotel rates will not be advanced.

All hotels are within ten minutes' walk of the Public Auditorium. There is practically no choice in the large hotels as to location or service. Everyone should read the Reservation Blank carefully and do as directed. These blanks have been published in the Journals.

A large number of reservations have been made and the indications are that the attendance will surpass all other meetings.

To handle the big crowd co-operation is necessary. It is earnestly requested that as far as possible when two or more can occupy a room they should do so.

EXHIBIT COMMITTEE

The Exhibit Committee of the American Dental Association wishes to place before the members of the American Dental Association the fact that the Dental Exhibit at the meeting of the American Dental Association at Cleveland, September 10 to 14 inclusive, will be the largest, most elaborate and instructive that has ever been held in connection with the American Dental Association. We want you to realize that the Dental Exhibit will not be simply a side issue or event of this meeting but will be one of the main attractions of the meeting of the American Dental Association.

In order to firmly impress this upon your mind it will be only necessary to state a few facts, namely:

The Exhibit Hall at the Public Hall is the most complete hall for this purpose in America. It is well lighted. The ventilation is superior to any other hall in America. Every convenience is already installed for the use of the exhibitor. Every arrangement has been made for utility and service, and it is the aim of this committee to give a service to the exhibitor he has never enjoyed before. This committee has these arrangements practically completed.

The members of this committee want the members of the American Dental Association to understand that we appreciate fully the immense value of a complete and diversified exhibit and we aim to give them something that they cannot afford to miss.

As far as the exhibits are concerned the success of this meeting is already assured, because we have signed contracts for more exhibits than any ever held in conjunction with

any meeting of the American Dental Association.

The sessions, registration, etc., of the meeting have been so arranged that eighty per cent of the activities of the meeting will be held in the Public Hall, where the exhibits will also be held. In the face of these facts—how can you afford to miss this meeting? You certainly cannot. Come to the Cleveland meeting, boost the Cleveland meeting, and help yourself and your neighbor.

EXCURSION FARES TO CLEVELAND MEETING

Excursion fares to the Cleveland meeting have been granted by practically all the railroads in the United States and Eastern Canada, on the Identification Certificate plan, instead of the Certificate plan as used heretofore by our organization.

Tickets will be sold at one and one-half fare (with minimum of $1.00) for the round trip on Identification Certificates. One of these certificates, applicable for a member and dependent members of his family, will be mailed to each member of the American Dental Association in ample time for the meeting. Tickets will be good via the same route in both directions, and will be on sale September 3 to 12 inclusive. Passengers returning must reach original starting point not later than midnight of September 20.

From Colorado (except Julesburg), Idaho, Montana, New Mexico, Utah and Wyoming, dates of sale are from September 1 to 10 inclusive, return limit September 21. From Arizona, British Columbia (on Great Northern railway only), California, Nevada, Oregon, and Washington, Summer Excursion fares, on a lower basis than the Identification Certificates, will be in effect. Tickets on sale daily from May 15 to September 15 inclusive with return limit of October 31. Stop-over privileges on summer excursion tickets will be permitted on both going and return trips.

All tickets will be validated at Cleveland, Ohio, by agents at the regular ticket offices of the lines over which tickets read into Cleveland, from September 10 to 20 inclusive, and when validated will be good for return leaving on any day within the final limit.

Tickets routed either by New York Central or Nickel Plate railways, between Buffalo and Cleveland are accepted for transportation on the steamers of the Cleveland and Buffalo Transit Company, at the option of the passenger. Meals and berths on shipboard are extra. For particulars address "Cleveland and Buffalo Transit Company," Cleveland, Ohio.

D. C. Bacon,
Chairman Transportation Committee.

LIST OF EXHIBITORS

Abbott Laboratories, 4753 Ravenswood Ave., Chicago, Ill.

Julius Aderer, 47 West 42nd St., New York City.

Alkalol Company, 141 Washington St., Taunton, Mass.

American Cabinet Co., Two Rivers, Wis.

American Surgical Specialty Co., 110 W. Oak St., Chicago, Ill.

W. V-B. Ames Co., Fremont, Ohio.

Antidolar Mfg. Co., 100 Main St., Springville, New York.

Ascher Import Co., 4900 Euclid Ave., Cleveland, Ohio.

Claudius Ash Sons & Co., 1-3 Union Square, New York City.

Bacon Mfg. Co., 416 LaSalle Bldg., Minneapolis, Minn.

Baker & Co., 54 Austin St., Newark, N. J.

L. E. Balter, Proctor Bldg., Mt. Vernon, New York.

Bard-Parker Co., 37 E. 28th St., New York City.

Becton, Dickinson & Co., Rutherford, N. J.

Frank S. Betz Co., Hammond, Ind.

Berry Dental Laboratory Co., 806 Equitable Bldg., St. Louis, Mo.

Blue Island Specialty Co., Blue Island, Ill.

Bristol-Myers Co., 40 Rector St., New York City.

Brophy Dental Mfg. Co., 1865 Ogden Ave., Chicago, Ill.

A. A. Brown Dental Mfg. Co., 506 N. Vandeventer Ave., St. Louis, Mo.

Buffalo Dental Mfg. Co., 587 Main St., Buffalo, N. Y.
Burns Dental Casting Machine Co., 88 State St., Flushing, N. Y.
H. B. Byrd Mfg. Co., 300 12th St., N. W., Washington, D. C.

L. D. Caulk Co., Milford, Del.
Central Dental Laboratory Co., 218 South Wabash Ave., Chicago, Ill.
Chayes System Laboratories, 7-11 W. 45th St., New York City.
Cleveland Dental Mfg. Co., 3307 Scanton Road, Cleveland, Ohio.
Colgate & Co., 199 Fulton St., New York City.
Columbia X-Ray & Elec. Corp., 131 E. 23rd St., Philadelphia, Pa.
Columbus Dental Mfg. Co., 634 Wager St., Columbus, Ohio.
P. N. Condit, 120 Boylston St., Boston, Mass.
Cook Laboratories, Inc., 536 Lake Shore Drive, Chicago, Ill.
Corega Chemical Co., 208 West St. Claire Ave., Cleveland, Ohio.
Curry Hand Piece Protector Co., Silverburg Bldg., Baltimore, Md.

Thomas J. Dee & Co., 5 S. Wabash Ave., Chicago, Ill.
Dent Medic Laboratory, Cleveland, Ohio.
Dental Chemical Co., Roslyn, Pa.
Dentists' Supply Co., 220 W. 42nd St., New York City.
Denver Chemical M'g. Co., 20 Grand Ave., New York City.
de Sanno & Hoskins, 1252 N. Broad St., Philadelphia, Pa.
Detroit Dental Mfg. Co., 6081 12th St., Detroit, Mich.
Dresch Laboratories Co., 622 Madison Ave., Toledo, Ohio.
August E. Drucker, 2679 California St., San Francisco, Cal.

Eastman Kodak Co., Rochester, N. Y.
Edwards X-Ray Corp., 111-113 N. New Jersey St., Indianapolis, Ind.
Electro Dental Co., 33rd & Arch Sts., Philadelphia, Pa.
Engeln Electric Co., 4601-11 Euclid Ave., Cleveland, Ohio.
Geo. E. Everett, D.D.S., 3156 Warren Ave., Chicago, Ill.

Fellows Medical Mfg. Co., 26 Christopher St., New York City.
H. Fischer & Co., Inc., 705 Lexington Ave., New York City.
Flint Dental Mfg. Co., Frankford, Philadelphia, Pa.

Foregger Co. Inc., 47 W. 42nd St., New York City.
Fort Wayne Dental Depot, 135 W. Washington St., Ft. Wayne, Ind.
Friedman Specialty Co., 822 Marshall Field Bldg., Chicago, Ill.

Garhart Dental Specialty Co., Somerville 42, Boston, Mass.
General Dental Mfg. Co., 56 Austin St., Newark, N. J.
Goldsmith Bros. S. & R. Co., Heyworth Bldg., Chicago, Ill.

Hanau Engineering Co., 255 Washington St., Buffalo, N. Y.
Hance Bros. & White, Philadelphia, Pa.
F. W. Hancock, 25 E. Washington St., Chicago, Ill.
Hanovia Chemical Mfg. Co., Chestnut St., & N.J.R.R. Ave., Newark, N. J.
Harmeyer & Brand Co., 91-96 Carew Bldg., Cincinnati, Ohio.
Harvard Company, Canton, Ohio.
J. E. Healy, 12 W. 44th St., New York City.
Heidbrink Co., 420 S. 6th St., Minneapolis, Minn.
John Hood Company, 178 Tremont St., Boston, Mass.
Chas. Holge Dental Depot, 5 South Wabash Ave., Chicago, Ill.
Horlicks Malted Milk Co., Racine, Wis.
Hugo Friedman Mfg. Co., 3654 Milwaukee Ave., Chicago, Ill.

Industrial Rubber Corp., Long Island City, N. Y.
J. W. Ivory, 42 N. 11th St., Philadelphia, Pa.

J. F. Jelenko & Co., 1 Union Square, New York City.
Johnson & Johnson, New Brunswick, N. J.
H. D. Justi & Son, 1301 Arch St., Philadelphia, Pa.

Kline & Kothe Co., 1335 Schofield Bldg., Cleveland, Ohio.
Kress & Owen, 361 Pearl St., New Haven, Conn.
Kolynos Co., New Haven, Conn.

Lambert Pharmacal Co., 21st & Locust Sts., St. Louis, Mo.
H. R. Lathrop & Co., 116 Beekman St., New York City.
Lavoris Chemical Co., 52 Western Ave., Minneapolis, Minn.
Lea & Febiger, 706 Sansom St., Philadelphia, Pa.
Lehn & Fink, 635 Greenwich, New York City.

Manhattan Coat Factory, 3223 N. Halsted St., Chicago, Ill.

Medical Protective Co., Ft. Wayne, Ind.

H. A. Metz Laboratories, Inc., 122 Hudson St., New York City.

E. C. Miller, Williamsport, Pa.

Minimax Company, 37 S. Wabash Ave., Chicago, Ill.

Mizzy, Inc., 1 Union Square, New York City.

Mynol Chemical Company, Real Estate Trust Bldg., Philadelphia, Pa.

J. M. Ney Company, Hartford, Conn.

Novocol Chemical Mfg. Co., 2923 Atlantic Ave., Brooklyn, N. Y.

Official Bulletin Pub. Co., 81 E. Madison St., Chicago, Ill.

Ohio Chemical Co., 1177 Marquette N. E., Cleveland, Ohio.

Owens Bottle Company, 1401 Nicholas Bldg., Toledo, Ohio.

Pelton & Crane Co., 632 Harper Ave., Detroit, Mich.

Pepsodent Co., 1104 S. Wabash Ave., Chicago, Illinois.

Chas. H. Phillips Chemical Co., 128 Pearl St., New York City.

Poloris Company, Inc., 79 E. 130th St., New York City.

Ransom & Randolph Co., 300 Rose Bldg., Cleveland, Ohio.

Rich-Alloy Company, 13223 Euclid Ave., Cleveland, Ohio.

Ritter Dental Mfg. Co., Rochester, N. Y.

G. D. Searle & Co., 4611-17 Ravenswood Ave., Chicago, Ill.

Senreco Corp., 304 Walnut St., Cincinnati, Ohio.

Lee S. Smith & Son Mfg. Co., Keenan Bldg., Pittsburgh, Pa.

E. R. Squibb & Sons, 80 Beekman St., New York City.

Steelcraft Co., 7880 Morrow St., Detroit, Mich.

I. Stern & Co., 106 E. 116th St., New York City.

Szabo & Beer, 30 E. 14th St., New York City.

Teter Mfg. Co., 1108 Williamson Bldg., Cleveland, Ohio.

Thwaites X-Ray Co., Grand Rapids, Mich.

Toledo Technical Appliance Co., 416 Adams St., Toledo, Ohio.

Union Dental Instrument Mfg. Co., 831 Cherry St., Philadelphia, Pa.

United States Dental Mfg. Co., 6705 Conrad Ave., Cleveland, Ohio.

Vernon Bros. & Co., 214 Stanwix St., Pittsburgh, Pa.

Victor X-Ray Corp., 236 S. Robey St., Chicago, Ill.

Wappler Electric Co., 162 Harris Ave., Long Island City, N. Y.

The Weber Dental Mfg. Co., Canton, O.

S. S. White Dental Mfg. Co., 211 S. 12th St., Philadelphia, Pa.

H. B. Wiggins Sons Co., Bloomfield, N. J.

Williams Gold Refining Co., 2978 Main St., Buffalo, N. Y.

Wilmot Castle Co., Rochester, N. Y.

John H. Wood Co., 126 Market St., Philadelphia, Pa.

Announcements

CALENDAR OF MEETINGS

NATIONAL SOCIETIES

American Dental Association, September 10-14, 1923, Cleveland, Ohio.

American Child Health Association, October 15, 16 and 17, 1923, Detroit, Michigan.

American Academy of Periodontology, September 7 and 8, 1923, Statler Hotel, Cleveland, Ohio.

American Society of Oral Surgeons and Exodontists, September 4 to 7, 1923, Cleveland, Ohio.

American Dental Society of Europe, August 1, 2, 3, and 4, 1923, Paris, France.

American Society of Dental Radiographers, September 7 and 8, 1923, Cleveland, Ohio.

American College of Surgeons, October 22 to 26, 1923, Congress Hotel, Chicago, Illinois.

Congress of Anesthetists, October 22 to 24, 1923, Auditorium Hotel, Chicago, Illinois.

National Board of Dental Examiners, September 10 and 11, Lattice Room, Hotel Statler, Cleveland, Ohio.

National Society of Denture Prosthetists, August 27 to September 8, 1923, Cleveland, Ohio.

Research Commission of the American Dental Association, September 8, at 10 A. M. and 8:30 P. M., Hollenden Hotel, Cleveland, Ohio.

Xi Psi Phi, September 7 and 8, 1923, Cleveland, Ohio. Headquarters, Winton Hotel.

STATE SOCIETIES

National Capital, first Tuesday of every month.

July

Montana, at Missoula (19, 20, 21).
Wisconsin, at Milwaukee (10, 11, 12).

September

Delaware, at Wilmington (12).

November

Arizona, at Chandler (2, 3).
Florida, at Jacksonville (8, 9, 10).
Georgia, at Athens (7, 8, 9).

MEETINGS OF STATE BOARD OF DENTAL EXAMINERS

Arkansas, at Arlington Hotel, Hot Springs, July 9, 10 and 11. Secretary, H. J. Crume, Wilson Building, El Dorado, Arkansas.

Colorado, at Denver, first Tuesday of December. Secretary, Wm. H. Flint, Littleton, Colorado.

Montana, at Helena, July 9 to 12 inclusive. Marshall A. Gates, Helena, Montana.

North Dakota, at Fargo, July 10, 11 and 12. Secretary, Galon Crum, 73 Edwards Building, Fargo, North Dakota.

Utah, at—, July 9 to 14. S. S. Burnham, 721 Boston Building, Salt Lake City, Utah.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK

The members of the First District Dental Society of the state of New York extend to those dentists contemplating a visit to New York City following the meeting of the American Dental Association at Cleveland, a most cordial welcome. We wish to meet you and to entertain you.

If you are planning a trip to the Metropolis, register now with the general secretary, stating date when you expect to arrive.

MISS E. M. DAVIES, *General Secretary,*
250 West 57th St., New York City, N. Y.
Room 2337.

FLORIDA STATE DENTAL SOCIETY

The annual meeting of the Florida State Dental Society will be held in Jacksonville, Florida, November 8, 9 and 10, 1923 and Post-graduate course for November 12-17.

SUSQUEHANNA DENTAL ASSOCIATION OF PENNSYLVANIA

The next annual meeting of the Susquehanna Dental Association of Pennsylvania will be held in Hotel Bethlehem, Bethlehem, Pennsylvania, October 17, 18 and 19, 1923.

J. B. BROUGHAM,
Chairman Publicity,
Bethlehem, Pa.

THE DENTAL HEALTH EXHIBIT AT CLEVELAND

The Public Health Exhibit to be staged on the main floor of the Cleveland Auditorium will undoubtedly excel all previous attempts to drive home a great lesson in mouth hygiene by the exhibit plan.

A careful study has been made of the various phases and regional needs for mouth hygiene educational plans, and it is confidently believed that the most inquiring and critical student of the various questions involved in mouth hygiene educational work will find something for which to commend the exhibit. The list of exhibitors at present is highly satisfactory, but the Council is very anxious to enlist the interest of any state, city or institution which may have a plan that is working successfully in educating the public along this line.

Another feature of the program will be the exhibition of the very best and latest educational motion pictures which will be shown in a hall, especially set apart for this purpose, on the first floor of the Auditorium. Short talks by men and women of national reputation will precede each picture. In several instances the producers of the pictures will appear.

Still another, and probably the most important feature of the program, will be the balanced lunch, followed by a round table conference of mouth hygiene workers, where a plan will be worked out looking to a permanent nation-wide organized effort to educate the public in matters pertaining to mouth hygiene. All state officers and state hygiene committees, and others who are especially interested in this work, will be invited to attend.

In short, the Mouth Hygiene and Public Instruction Council takes this means of calling the attention of the profession to this effort to advance a movement, the importance of which cannot be too greatly emphasized. A careful consideration of the importance of a well organized and systematic endeavor in promoting the educational movement in mouth hygiene, and the realization that no more auspicious time than the present could be desired for this concerted effort, will result in a general advance in all lines of dentistry.

W. R. WRIGHT, *Chairman.*

INVITATION FROM THE WESTERN RESERVE UNIVERSITY DENTAL SCHOOL

June 7, 1923.

Dr. Otto U. King, Secretary,
American Dental Association,
Chicago, Illinois.

Dear Dr. King:

At at meeting of the Faculty of the Dental School of Western Reserve University it was voted to extend an invitation to all members of the American Dental Association, the National Society of Denture Prosthetists, the American Academy of Periodontology, the American Society of Oral Surgeons and Exodontists, and all other dental associations holding conventions in Cleveland next September, to visit the college while in the city.

The college building will be kept open during the day to serve the convenience of visitors.

The faculty of the Dental College wishes to join the dentists of Cleveland in extending a most cordial welcome to the dentists of the United States to come to Cleveland for the convention.

Will you please publish this invitation.

Yours very truly,
J. P. HENAHAN,
Secretary of the Faculty.

THE AMERICAN ACADEMY OF PERIODONTOLOGY 1913-1923

The next meeting will be held at the Hotel Statler, Cleveland, Ohio, September 7 and 8, 1923. This is the tenth annual meeting and held in the city in which the Academy was organized, and many special features are being planned.

One entire day will be devoted to the discussion of "Traumatic Occlusion; What is it? and How May it be Corrected?" The subject will be presented and discussed by two periodontists, an orthodontist, a prosthodontist, and a general practitioner. The Chairman of the Program Committee, Dr. Russell W. Bunting, of Ann Arbor, promises just as interesting sessions for Friday evening and Saturday. The annual banquet for members and guests will be held on Saturday evening. All members of the American Dental Association interested in this subject, are invited to attend all sessions.

GRACE ROGERS SPALDING, *President,*
235 Eliot St., Detroit, Mich.
J. HERBERT HOOD, *Secretary,*
624 Hanna Bldg., Cleveland, O.

MEETING OF THE AMERICAN DENTAL LABORATORIES ASSOCIATION

September 11 and 12

(Annex "A" Ballroom, Hotel Cleveland.)

TUESDAY AFTERNOON, SEPTEMBER 11

1:00 P. M. Opening Address.
By President.

1:30 P. M. "Some Suggestions in Standardizing Requirements for Impressions, Bites, Measurements, etc., to Enable the Laboratories to Produce Better Results."
By Samuel G. Supplee ....New York City.

2:30 P. M. "Selection and Arrangement of Teeth, Covering Color Harmony and the Application of the Optical Illusion Effect in Arrangement."
By P. C. Lowery, (D.D.S.) .....Detroit, Mich.

3:30 P. M. "Costs, Prices and Quality as Applied to Dental Laboratories."
By G. W. Clapp, (D.D.S.) ..... New York City

WEDNESDAY AFTERNOON, SEPTEMBER 12

1:00 P. M. "The Commercial Dental Laboratory—Its Past, Present and Future."
By M. M. House, (D.D.S.) .....Kansas City, Mo.

2:15 P. M. "The Necessity of Greater Care in the Preparation of Study and Working Models by the Dentist."
By W. A. Giffen, (D.D.S.) Detroit, Mich.

3:15 P. M. "How Dr. Monson's Spherical Principles Can be Applied to the Best Advantage in the Dental Laboratory."
By B. I. Martinez, (D.D.S.) .....St. Paul, Minn.

4:15 P. M. "Laboratory Team Work and Relation of Dentists to the Laboratory."
By E. L. Mueller .....Omaha, Neb.

7:00 P. M. "Design and Construction of Cast Clasps, for Tooth Bearing and Tissue Bearing Restorations: Together with Saddle Area Design for Tissue-Bearing Partials."
By I. J. Dresch .....Toledo, Ohio.

8:30 P. M. "Financial Statistics and Statistical Reports, and Their Value to the Management."
By W. H. Schroll .....Chicago, Ill.

9:30 P. M. "Practical Ideas for Castings and Showing for the First Time Before Any Society, a New Tooth That is Destined to Revolutionize the Practice in Fixed and Removable Bridge Dummy Construction."
By J. C. Schwartz .....St. Louis, Mo.

SPECIAL NOTICE

"Admission by Ticket only"—Tickets can be secured by addressing our Secretary, Mr. W. H. Schroll, 5 So. Wabash Avenue, Chicago, Illinois.

QUALIFICATIONS: Prosthetic Dentists or Ethical Dental Laboratory owners, subscribing to the Code of Ethics established by our organization and who are members of local ethical organizations. Copies of the Code of Ethics can be secured from Mr. Schroll on application.

AMERICAN SOCIETY OF ORAL SURGEONS AND EXODONTISTS

The annual convention of the American Society of Oral Surgeons and Exodontists will be held in Cleveland during the week preceding the American Dental Association meeting, September 5, 6, 7, 8, 1923. Headquarters will be in the Hollenden Hotel. The Hotel management has given every possible assistance to making this meeting a success and has reserved for our exclusive use all rooms necessary on the mezzanine floor.

The various committees have been hard at work and reports so far submitted go to show that one of the most successful meetings in the history of the organization will result.

The Program Committee and the Clinic Committee have reported the perfection of a most complete scientific program, and the Local Arrangements Committee has already perfected nearly all details for the meeting.

The Entertainment Committee has arranged to keep all happy during any leisure hours.

A dinner-dance will take the place of the usual banquet, and other features are held in reserve as a surprise.

Elsewhere will be found the reports of other officers giving other details of this meeting.

The Ohio Society of Oral Surgeons extends a cordial welcome to all members of the American Society of Oral Surgeons and Exodontists. They hope for the pleasure of being our hosts.

The following is the scientific program:

Cleveland, September 5, 6, 7, and 8, 1923

Hollenden Hotel

"Surgical Technic for Impacted Cuspids"
By Roy S. Hopkinson, Wilwaukee, Wis.

"Interseptal Alveolotomy"
By O. T. Dean .....Seattle, Wash.

"Circumferential Wiring of the Mandible for Reducing Fractures"
By E. W. Browning .....Salt Lake City, Utah.

"Conservative Diagnosis and Surgery"
By Earl H. Thomas .....Chicago, Ill.
"Impacted Teeth"
By Joseph P. Wahl ....New Orleans, La.
"Radiography in Exodontia and Oral Surgery"
By Clarence O. Simpson, St. Louis, Mo.
"Intraoral Radical Antrum Operation"
By Menifee H. Howard .....Denver, Col.
"(a) What Constitutes a 100 per cent full set of Radiographs, a Summary of the Answers Received from the Leading Men of the Country in Answer to a Form Letter"
"(b) Factors That I Use in Radiographic Production and Why I Use Them"
By James Freer .....St. Paul, Minn.
"Post-Operative Complications"
By Henry B. Clark .....St. Paul, Minn.
"Preparation of Solution"
By Arthur E. Smith ....Los Angeles, Cal.
"The Breath—Holding Test as a Preliminary to Nitrous Oxid—Oxygen Anesthesia"
By F. H. McMechan ....Avon Lake, Ohio.
"Ethylene, the New Gas Anesthetic"
By A. B. Luckhardt, University of Chicago .....Chicago, Illinois.
"A Review of the Essentials to Successful Nitrous Oxid-Oxygen Anesthesia"
By J. A. Heidbrink ....Minneapolis, Minn.
"The Organization of State Oral Surgery Societies"
By J. D. Sullivan .....Toledo, Ohio.
"Some Phases of Diagnosis in Oral Surgery"
By Hugh W. MacMillan .....
.....Cincinnati, Ohio.
"Establishing the Facts and Results of Dental Surgical Procedure as it Affects Both the Surgeon and the Practitioner"
By H. A. Tuckey .....San Francisco, Cal.
"Osteomyelitis of the Mandible and Maxilla"
By Theodore Blum, ...
.....New York City, N. Y.
"The Preparation of the Mouth for the Reception of Dentures"
By Frederick F. Molt .....Chicago, Ill.
To be presented before joint session, with Denture Prosthetists.
"Conditions Most Favorable for the Wearing of Dentures"
By Robert Gillis .....Hammond, Ind.
"Table Clinics to Follow"

THE ANNUAL POST-GRADUATE COURSE IN THE ROYAL COLLEGE

Immediately following the meeting of the National Dental Association in Cleveland, the Board of Directors of the Royal College of Dental Surgeons will conduct an intensive post-graduate class at the College Building in Toronto, from Monday, September 17, to Saturday, September 22, 1923.

The following subjects have been decided upon, from which each member may choose: Preventive Dentistry, Diagnosis, Pathology, Periclasia, Operative Dentistry, Surgery, Partial Dentures, Crown and Bridge, and Full Denture Work.

The personnel of instructors is as follows: Drs. I. H. Ante, W. F. Cummer, J. A. Bothwell, E. F. Risdon, Harold K. Box, Edgar Paul, F. A. Clarkson, A. E. Webster and Wallace Seccombe.

A cordial invitation is extended to all ethical practitioners. Those who attend the National Dental Association meeting in Cleveland will find Toronto but nine hours' railroad journey from Cleveland. Further particulars may be had by addressing the Royal College of Dental Surgeons, 240 College St., Toronto, Ontario.

RESOLUTIONS PASSED BY THE ILLINOIS STATE DENTAL SOCIETY IN ANNUAL SESSION ASSEMBLED AT DECATUR, MAY 9, 1923, IN REGARD TO THE PASSING OF DR. CALVIN S. CASE.

WHEREAS, the members of the Illinois State Dental Society, having learned of the passing of one of its most distinguished and beloved colleagues, Dr. Calvin S. Case, and

WHEREAS, his many years of service to the profession and people in his chosen specialty had made his name synonymous with all that was progressive and scientific in its practice, and

WHEREAS, his sterling character and charming personality had endeared him to an ever widening circle of friends; therefore be it

Resolved, that the Illinois State Dental Society, in session assembled, wishes to place on record its appreciation of his outstanding ability and his man contributions to the science and art of dentistry and his generous helpfulness to those who sought his professional aid; also be it

Resolved, that we give expression to our gratitude for the privilege of having labored with him for so many years, and our profound sorrow that he has been taken from our midst; and be it further

Resolved, that the Secretary be instructed to spread these resolutions on the records of the Society and to send copies of the same to the Dental Journals and to the family of Doctor Case.

METROPOLITAN LIFE INSURANCE COMPANY

New York City, June 11, 1923.

Dear Editor:

For many years we have placed on file articles, reprints, leaflets and pamphlets upon Oral Hygiene and related topics. This file is always open for the use of those interested in this work.

Will Authors and Committees who publish such articles kindly place us upon their mailing list? Due acknowledgement will be made of the receipt of such articles.

Yours truly,

THADDEUS P. HYATT,
Dental Director.

NEW BOOKS RECEIVED FOR THE LIBRARY OF THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION

The Journal of the American Dental Association promptly acknowledges herewith the receipt of new publications. Books selected from those named on this list are reviewed below. Reviews are matter-of-fact statements of the nature and contents of the publications referred to and are intended *solely to guide possible purchasers.*

Aids to Operative Dentistry. J. D. Hamilton Jamieson, H.D.D., L.D.S. Ed. Dental surgeon to the Edinburgh Dental Hospital; Lecturer on introductory dental surgery and gold-filling to Edinburgh Dental School; etc; 168 pages. Wm. Wood & Company, New York. $1.50.

Ultra-Violet Energy in Dentistry. Biophysical Studies by Dr. A. J. Pacini, Director of Biophysical Research, Victor X-Ray Corporation, Chicago. 67 pages, 42 illustrations.

Dental Materia Medica and Therapeutics. Wesley Barritt, O.B.E., Ph.C., L.D.S., Eng., and Alfred Templar Barritt, L.D.S., Eng. 2nd edition, revised and enlarged. A simple tabulated classification of drugs and remedies used in dental operations and in the treatment of dental diseases. Henry Kimpton, London. 10/6 net.

The Chemistry of Dental Materials. C. S. Gibson, O.B.E., M.A., and B.Sc. (Oxon.), M.Sc. Tech. (Manc.), F.I.C. Professor of Chemistry at Guy's Hospital Medical School in the University of London. 24 illustrations, 176 pages. P. Blakiston's Son & Co., Philadelphia, Pa. $3.50.

Operative Dental Surgery. Thomas Goodhugh, Lecturer on Operative Dental Surgery to the Incorporated Dental Society, London., Demy 8vo. Pp. x plus 335 with 96 illustrations, mostly original. Bailliere, Tindal & Cox, London 18/ net. (Postage 10d.)

Epidemiology and Public Health. Vol. II. Victor C. Vaughan, M.D., LL. D., Emeritus Professor of Hygiene in the University of Michigan, Assisted by Henry F. Vaughan, M.S., Dr. P. H. Commissioner of Health of the City of Detroit and George T. Palmer, M.S., Dr. P. H., Epidemiologist for the Department of Health of the City of Detroit. 917 pages. C. V. Mosby Co., St. Louis, Mo. $9.00.

Cerebrospinal Fluid in Health and in Disease. Abraham Levinson, B.S., M.D., Associate in Pediatrics, Northwestern University Medical School; Attending Physician, Department of Contagious Diseases, Cook County Hospital, Chicago, etc., with a foreword by Ludvig Hektoen, M.D., 2nd edition, thoroughly revised. 267 pages, 69 illustrations, including 5 color plates. C. V. Mosby Company, St. Louis, Mo. $5.00.

The Tonsils. Faucial, Lingual, and Pharyngeal. Harry A. Barnes, M.D., Instructor in Laryngology, Harvard Medical School, Laryngologist, Massachusetts Charitable Eye and Ear Infirmary, etc. 2nd edition, 217 pages, illustrated. C. V. Mosby Co., St. Louis, Mo. $5.00.

Tonsillectomy. By means of the alveolar eminence of the mandible and guillotin. Greenfield Sluder, M.D., F.A.C.S., Clinical Professor and Director of the Department of Rhinology, Laryngology and Otology, Washington University School of Medicine, St. Louis, Mo. 176 pages, 90 illustrations. C. V. Mosby Co., St. Louis, Mo. $5.00.

World Metric Standardization. Compiled by Aubrey Drury, in collaboration with Clifton Hildebrand, W. Mortimer Crocker, Harry Allcock, M.I.E.E., and other members of the world metric standardization council. A volume of testimony urging worldwide adoption of the metric units of weights and measures—meter; liter; gram. Published by World Metric Standardization Council, San Francisco, California. $5.00.

THE AMERICAN DENTAL GOLF ASSOCIATION

Ralston I. Lewis, President; Frank M. Casto, Ex-President; Thomas P. Hinman, Ex-President

After considerable anxiety as to what plans might be made to accommodate members of the American Dental Golf Association in Cleveland, the local committee is pleased to announce that the fourth annual tournament will be held.

The severe restrictions of privileges extended to associations of any kind by directors of local clubs make it necessary to hold the tournament over at least three courses. The clubs extending privileges to date are Willowick, Canterbury and Oakwood. So far as can be arranged, Monday, September 10 will be the date or at least the beginning of the large event and some feasible way which we hope to be satisfactory, will be planned if all members co-operate in forwarding in advance any information requested. This will be absolutely necessary if confusion is to be avoided and the proper mental composure retained for the good of the individual's game.

The Dental Golf Association of Cleveland which was recently organized is doing everything in its power to make this meeting a real success.

Arrangements are complete for the golf dinner which will be held in the Rainbow Room, Hotel Winton, on Sunday, September 9, at 7 P. M. The price will be $4.00 and your reservation can be made now.

The Calcutta Pool, which by this time needs no introduction, will follow after dinner, Dr. C. M. Benbrook of Los Angeles, having been extended an invitation to be auctioneer to complete the setting.

The following is the program to date. The events with prizes and names of donors for each event are planned but on account of the prize list being incomplete same will be subject to change.

TOURNAMENT, Clubs: Willowick, Canterbury and Oakwood. Monday, September 10, 1923.

Playing time given to foursomes according to entry. First foursome starting at 7:45.

DINNER, Winton Hotel, Rainbow Room, Sunday, September 9, 7:00 P. M.

EVENTS, Entire Play. 36-Hole Medal Play, Association Championship Prize; President's Trophy and name engraved on Williams Trophy, Runner-Up for this event; Prize: Southern California Dental Golf Club Trophy. 36 Hole Medal Handicap Play; Prize: Dental Golf Association of Cleveland Trophy, Runner-Up for this event, Prize: Southern States Dental Golfers' Trophy.

MORNING PLAY, 18-Hole Medal Handicap, Class A; Prize: Sterling Silver Trophy, Thos. J. Dee Company, Chicago, Illinois. Runner-Up for this event, Prize: Aseptic Vitrolite Top Dental Table, The Harvard Company, Canton, Ohio.

18-Hole Medal Handicap, Class B, Prize: Holmes Sterilizer and Table, Guthrie Dental Supply Company, Cleveland, Ohio. Runner-Up for this event, Prize: 1 Set 21 Clev-Dent Plastic Instruments, Cleveland Dental Manufacturing Company, Cleveland, Ohio.

18-Hole Medal Handicap, Class C, Prize: Roach Casting Machine, Dental Products Company, Chicago, Illinois. Runner-Up for this event, Prize: 1—6 Shade Box Synthay Porcelain, Garhart Dental Specialty Company, Somerville, Mass.

18-Hole Medal Handicap, Class D, Prize: Gardner Casting Machine, Kline & Kothe Company, Cleveland, Ohio. Runner-Up for this event, Prize: 1 Box Crown & Bridge Cement, The W. V-B Ames Company, Fremont, Ohio.

AFTERNOON PLAY, 18-Hole Low Gross, Class A, Prize: Operating Stool, Ransom & Randolph Company, Cleveland, Ohio. Runner-Up for this event, Prize: 2 Books, Selected by Winner, C. V. Mosby Company, St. Louis, Missouri.

18-Hole Low Gross, Class B, Prize: Low Temperature Gas Furnace, J. M. Ney Company, Hartford, Connecticut. Runner-Up for this event, Prize: 1 Large Box Assorted Colors C. A. S. Cement, Claudius Ash Sons & Co. Inc., U.S.A., New York City.

18-Hole Low Gross, Class C, Prize: 1 Binocular Dentascope Complete, Engeln Electric Company, Cleveland, Ohio. Runner-Up for this event, Prize: 12 Boxes Maves Wax, Heidbrink Company, Minneapolis, Minn.

18-Hole Low Gross, Class D, Prize: 1 Oak or Mahogany Waste Receiver, American Cabinet Company, Two Rivers, Wisconsin. Runner-Up for this event, Prize: 1 Box Golf Balls, Weber Dental Manufacturing Co., Canton, Ohio.

Other events and prizes will be listed later.

SCENES ON THE GOLF COURSES, CLEVELAND, OHIO.

Prizes donated to date not listed above:

1 Box Silver King Golf Balls, Columbus Dental Manufacturing Company, Columbus, Ohio.

Goldsmith Brothers S. & R. Co., Chicago, Illinois. Silver Loving Cup.

Borine Manufacturing Company, New York, N. Y. 1 Dozen each. Tooth Brushes, Boricular Paste, Borine Tooth Powder, Large size Borine Mouth Wash.

Walter P. Krause, Kansas City, Missouri. 1 Dwt. each, 16, 18, 20 K. Gold Solder.

The Pattison-McGrath Company, Kansas City, Missouri. 1—6 Color Package Dental Cement.

The officers, in behalf of the American Dental Golf Association, wish to thank the dealers and manufacturers for donation of prizes for the tournament and request all members to remember this kindness and good fellowship in favors they may bestow.

Under any circumstances, prizes must not be returned for credit and if not serviceable to winner kindly inform secretary and treasurer.

All members of the American Dental Association are eligible to membership in the American Dental Golf Association and those wishing to join will please fill out application blank below and mail at once.

THE AMERICAN DENTAL GOLF ASSOCIATION

(Application for Membership)

I hereby make application for membership in the American Dental Golf Association, and agree to comply with its By-Laws.

FEE $3.00. Paid only once and should accompany application.

Name .....

Street .....

City—State .....

Club .....Handicap.....

Fill out and mail at once to James A. Loughry, Sec., 1311 Schofield Bldg., Cleveland, Ohio.

To facilitate matters for the local committee arrange your foursomes now and make entrance accordingly as assignment to courses will be made in this way. A handicap card will be mailed all and you will please be prompt in having same filled out by your Club Secretary and return to American Dental Golf Association, 1311 Schofield Building, Cleveland, Ohio.

Those who expect to tour by automobile to Cleveland and wishing to play courses enroute will be assisted if you inform American Dental Golf Association, 1311 Schofield Building, Cleveland, Ohio, of intended route and stop-over cities.

All members who anticipate arriving in Cleveland previous to September 9, wishing to play golf will please inform Dr. H. D. Grubb, 624 Hanna Building, Cleveland, Chairman of Local Committee.

GOLF HEADQUARTERS

The Golf Headquarters will be at 1311 Schofield Building, Cleveland until Saturday, September 8; during meeting, announcement will be made later.

DINNER RESERVATION

Enclosed please find $4.00 for American Dental Golf Dinner reservation, Sunday evening, September 9, Rainbow Room, Hotel Winton, Cleveland, Ohio.

Sign .....

GREETINGS FROM THE GOLFERS OF THE PACIFIC COAST

By Wallace H. Spinks, Los Angeles, California, Hon. President of the American Dental Golf Association

From all we hear of the coming meeting of the American Dental Association in Cleveland, Ohio, September 10-14, it should be the best meeting ever held. We in Los Angeles might be rather loath to admit this, but such is not the case; for we realize that there are many reasons why a city of the size and geographical location of Cleveland should stage at least a larger meeting than was held here last year. Whether it will be a *better* meeting remains to be seen. We hope and believe that it will be.

One of the side attractions of the Los Angeles meeting that stands out conspicuously in the minds of a large and growing group of men, was the Golf Tournament. Cleveland should have even a more enthusiastic meeting. Golf is rapidly increasing among business and professional men everywhere. Today there is scarcely a National meeting of any kind held but what has its Golf Tournament. Almost every Bulletin published by dental societies mentions golf activities among its members. And why should it not be so? Golf is truly a gentleman's game. It teaches men to be broad, to be regular fellows, four square and true. One cannot play the game long without realizing the viewpoint of the other fellow; that there is something good in every man. Golf brings out the good qualities of the man. True, there are times when other qualities are also displayed; but never in the real golfer. It is but natural that men should differ in their estimate of men; in their conclusions rela-

tive to certain problems of life. Golf leads us to know and realize that in these matters frequently the other fellow may be right in his estimate and in his conclusions; and that there is a possibility that we may be wrong. When men reach this stage of life, they are at least safe.

It would be difficult to estimate the good that golf has accomplished here in Southern California. It has engendered the spirit of fellowship among members of the profession and brought about a harmony that spells success in whatever is undertaken. This we feel was demonstrated at the meeting of the American Dental Association last year.

Just at this time a tournament is being arranged between the dentists of San Francisco and the Bay District, and the dentists of Southern California. We meet in Del Monte, May 25-26. From the Southland a party of seventy, including the ladies, will be on hand. Fifty players from here will meet fifty from the Northern District. We do not underestimate the strength of our opponents, but we leave with the determination to win—just as we are coming to Cleveland in September. But when we come to Cleveland we come as a united group—not from the Bay District of the North, nor from Southern California; but from the entire Pacific Coast. Let us all join in making the Golf Tournament at Cleveland a grand success; then enter into the various activities of the meeting of the American Dental Association with the same spirit and enthusiasm. The golfers of the Pacific Coast send greeting to the golfers of the East, the South, the Middle and Central West, all of whom we hope to meet again in Cleveland in September.

Shaker Heights Country Club.

OUR AMERICAN DENTAL GOLF ASSOCIATION

For What It Stands and the Benefit It Is to the Dentist of Today

By Ralston I. Lewis, President, American Dental Golf Association

The American Dental Golf Association stands for the highest and best qualities that make for good fellowship. Men from all over the world can meet on an equal plane and feel that they are welcomed by their fellow players regardless of their scores, if they "play the game" as gentlemen and sportsmen. The good players never hesitate to play with the poor ones, but sometimes the poor players fear to accept an invitation from fellows whom they know to be superior. They need not. In our Association our scratch players are glad to have others watch their shots and ask

questions and the feeling of diffidence soon gives way to real enjoyment.

At a dinner, held after the wonderful Los Angeles meeting, there was a group of the most active members, who helped make the meeting a big success and among them were Doctors Buckley, Spinks, Hartley, Benbrook, Ford and others, to whom Dr. Hinman expressed the sentiment that he would sooner confide in a "golf friend" than any other type. He said such a friend would protect a man's interests and fight for him sooner than any one else. So say we all. It's the spirit of our Association and our motto is, "The higher the morale, the lower the score."

As to the *benefits* it brings to the dentist of today, they are too numerous to mention. He is taken out into the fresh air, given a constructive form of exercise, helps to keep the body and mind clean (provided he stays out out of the bunkers) and equipped with a healthy mental and physical reserve. The man who takes at least one full day a week away from his chair, meets the demands of a busy patient in a more efficient way, than the overtired dentist possibly can. To illustrate, there was a recent article in one of our financial journals relative to a visit made by a busy financier to a New York dentist.

Mr. X was so impressed with the speed and accuracy, lack of useless chatter, the few sittings necessary to complete the work, as well as the remarkable advancement in dental hygiene, that when he paid his bill, he said to the dentist, who is one of our members, "Even though the fee is high, I have saved money."

Of course all patients are not busy financiers to whom time is so valuable, but they all appreciate efficiency. Not the least of these is the chap who plays golf himself. Is it not true, that some of the best patients you have are some you meet in a golf game to say nothing of the *number* you acquire in this way? If you are married you owe Sunday to your wife and family, which is a final argument for our Association, since we play golf on Wednesday!

THE AMERICAN DENTAL GOLF ASSOCIATION

By Frank M. Casto, Cleveland, Ohio.

The American Dental Golf Association will hold its Fourth Annual Tournament in Cleveland, Monday, September 10. This will also mark the fifth year of its organization. It was, therefore, suggested that a brief history might be of value and interest to the members. The proposition had been discussed from time to time, but it was left to the California contingent to inspire its organization.

The following small group of men, Wally Spinks, Nye Goodman, Frank Warren, Charlie Hartley, Tom Hinman, Rally Lewis and Frank Casto, were called together during the National Dental Association meeting at New Orleans in October, 1919 and the organization was effected and the American Dental Golf Association made a reality. F. M. Casto was elected chairman and Ralston I. Lewis, secretary-treasurer. They were instructed to inaugurate a membership campaign and to write up a set of by-laws to be submitted to the members for adoption at the Boston meeting in 1920. These instructions were followed out. With the assistance of a number of enthusiastic golfers throughout the country and the various Dental Journals, a membership of about two hundred was secured.

The first annual meeting was held at Boston in 1920, where by-laws were adopted and a permanent organization effected. The following officers were elected: F. M. Casto, president; F. R. Chapman, vice-president; Ralston I. Lewis, secretary-treasurer; George W. Clapp, director for one year; Frank L. Warren, director for two years; W. A. Capon, director for three years.

The first tournament was held that year over the Woodland Country Club course; about ninety men participated and it was a big success. A large number of events were arranged and suitable prizes provided by the organization for each event. H. D. Grubb of Cleveland won the Association championship.

A banquet was held at the Club on Monday evening and everybody present was enthusiastic over the future prospects of the Association.

The next annual meeting was held in Milwaukee, Sunday, August 14, 1922 and the following officers were elected: Thomas P. Hinman, president; Charles Hartley, vice-president; Ralston I. Lewis, secretary-treasurer.

A dinner was arranged at the Blue Mound Country Club for Sunday evening and the tournament was held upon this course the following day. The California bunch, not to be outdone, inaugurated this year a most unique feature in the way of a Calcutta pool. Charlie Benbrook of Los Angeles was chosen the auctioneer and it was agreed by all the men that if he were not such an excellent dentist he had missed his calling, because he certainly put the proposition over big. The occasion was a most pleasant one and was ap-

preciated by all but more especially by those who were fortunate enough and wise enough to pick the winners.

A large number of events were scheduled and suitable prizes given to the winners. A beautiful and expensive trophy was donated by the Williams Company of Buffalo, to be played for each year. The membership had been increased to about three hundred and

Frederick Lush, 1922 Golf Champion.

there were about one hundred and fifty men entered the tournament. The championship was again won by H. D. Grubb of Cleveland.

The third annual meeting and dinner was held at the Embassador Hotel, Los Angeles, Sunday, July 16. There were about two hundred and fifty in attendance. The following officers were elected: Wallace H. Spinks, honorary president; Ralston I. Lewis, president; Frederick Lush, vice-president; James A. Loughry, secretary-treasurer. This was an arousing and spirited meeting.

During the day the Los Angeles boys arranged to have motion pictures made of the various players who were to be sold in the Calcutta pool. In addition motion pictures were made of a large group of golfers in attendance. As the pictures of the various players were shown upon the screen, Charlie Benbrook who was again chosen as auctioneer, sold them.

The tournament was held the next day on the beautiful Los Angeles Country Club course. About two hundred players engaged in this tournament. A large number of events were scheduled and about sixty prizes awarded to the winners. Practically all of the prizes were donated, either by individuals or by dental manufacturers. These prizes included everything from "soup to nuts" and represented a value of approximately one thousand dollars. Frederick Lush of Cincinnati, Ohio, won the association championship.

The Los Angeles boys set a precedent in entertainment, hospitality and arrangements that will make it very difficult for future local committees to maintain. While we in Cleveland do not expect to be able to maintain the pace set, we will, however, offer every hospitality that conditions permit. We rather expect to have the largest number of entrants and have, therefore, found it somewhat difficult to make the necessary arrangements with Golf Clubs; however, at this time it seems that suitable and satisfactory arrangements have been made. In anticipation of the large number expected to play, at least three eighteen hole courses seem necessary. We do not like to divide the players in this way, but under the circumstances it is the only thing that can be done.

Looking forward to an unprecedented meeting of the American Dental Association and likewise the American Dental Golf Association, we extend a most cordial welcome to all.

HEALTH FOR THE DENTIST

By Thomas P. Hinman, D.D.S., F.A.C.D., Atlanta, Georgia. Ex-President, A.D.G.A.

The average life of the dentist at the operating chair covers a period of about fifteen or twenty years. His work, being a mixture of mental concentration and physical exactness, puts an immense strain on both mind and body. A few practitioners have sufficient physical resistance to stand the strain for many years without breaking the strength;

however, the continuous confinement practically always causes physical and mental depression.

Any machine wears out without rest. Yet with the human machine, rest does not necessarily mean a dead stop. Rather is rest a "fitting," not a "quitting"—a complete "turning-around"—a change, a recreation. This is rest in the real sense.

Of all rest and recreation, nothing quite equals golf for the busy dentist. It takes him out of his office into the open where the tired nerves may fully relax, and the health-giving ozone makes him forget the atmosphere of the indoors office building. Here he has opportunity to practice preventive instead of curative methods, for here is health preserved, not restored. Health is the only real asset we have in life, anyway. It has been said that the American works the first forty years of his life accumulating money, and then spends the remainder of his life, and the money he has accumulated, trying to restore the health he lost in the battle for money. But health, once broken, is most difficult—I might say is almost impossible of restoration.

Golf is the preventive, not the curative method. It not only gives the physical exercise so absolutely necessary for health, but the mental perspective is undoubtedly one of concentration on the task at hand. For who can play golf and think of anything but the "pesky pill?"

Again, golf is not a game merely for youth but is the only game that can be played by people of all ages. This perhaps is one reason the growth of golf in the business world has been so phenomenal, and so marked that really one is rather lost among men unless he can talk and play a little golf.

Not only is golf to be commended for its recreation and for its health-giving features, it is also an education within itself along more than one line. Certainly it is a wonderful impetus to the increasing of one's vocabulary. I once heard a Minister say that when he got into a trap and it took six strokes to get out, that the English language did not have sufficient words to express his thoughts on that occasion. And to the man who stood by him and had previously used some vigorous expletives, he said: "My friend, you have expressed by sentiments exactly."

The companionship of golf is ideal. Men who play together become closer than brothers and the lasting friendships formed on the golf course are undisputed proofs that Oliver Goldsmith was not altogether right when he said that friendship was only a "name" and a "charm that lulls to sleep."

Thus is golf worth while for more reasons than merely the keen delight in playing the game. For aside from this, the friendships formed, the rest, the recreation and the real aid to health should commend the game to every dentist who wishes to prolong his life and give to his fellow man a service based on sanity and wisdom.

THE AMERICAN DENTAL TRAP-SHOOTERS' ASSOCIATION

First Annual Tournament Cleveland, Ohio, September 10, 1923

The Trapshooters of the American Dental Association will be interested to know that the grounds of the Northern Ohio Gun Club at the foot of 49th Street, Cleveland, Ohio, will be open for practice Sunday, September 9, 1923, at 1 o'clock P. M., for all who wish to practice before the tournament which will start at 1 o'clock, Monday, September 10, 1923.

The tournament will consist of 4-25 target event, 16 yards rise. Each 25 target event will be a race and suitable trophies will be awarded to the high scores in each 25 target event. A Championship Cup will be awarded to the contestant making the highest score on the total 100 target (4-25 target events). Ties will be shot off immediately after the close of the 100 target event.

The winner of the Championship Cup will not be eligible to win any of the trophies in the 25 target event. Should the contestant so desire, an Optical Sweepstake will be arranged at the time of making entries.

A good assortment of loaded shells will be on sale on the grounds at regular prices.

Through the courtesy of the Dupont Powder Company and the Winchester Repeating Arms Company, Mr. L. J. Squire and Mr. John R. Taylor will manage this tournament.

AMERICAN DENTAL ASSOCIATION

CLEVELAND, OHIO, SEPTEMBER 10-14, 1923

HOTEL RESERVATIONS

In securing hotel reservations for the coming convention, consult the hotel rate-sheet and fill out the blank application below. Mail it *immediately* to the *hotel* you wish to patronize. The hotel will then advise you of the reservation which they make for you.

KEEP THIS REMINDER OF YOUR RESERVATION

Hotel Selected .....

No. of Rooms .....

No. of Persons .....

Date of Reservation .....1923.

Detach here and keep the above for reference

MAIL THIS APPLICATION DIRECT TO HOTEL

HOTEL RESERVATION

American Dental Association, Cleveland, Ohio, September 10-14, 1923

.....HOTEL 1923
Cleveland, Ohio.

Please reserve the sleeping accommodations noted below:

.....Room(s) with bath for.....people. Rate desired $.....
(per day)

.....Room(s) without bath for.....people. Rate desired $.....
(per day)

I hereby agree to pay for rooms described from morning / evening of September .....to September ....., unless cancellation is made by August 20, 1923.

List names and addresses of all who will occupy the room with you.

Name ..... Address .....
Street, City and State

Name ..... Address .....
Street, City and State

Name ..... Address .....
Street, City and State

Name .....

Street .....

City .....State .....

HOTEL ROOM RATES–CLEVELAND

HOTEL	Room Capacity	ROOM WITH BATH: One person per day	ROOM WITH BATH: Two persons per day	ROOM WITHOUT BATH: One person per day	ROOM WITHOUT BATH: Two persons per day
ANSONIA 3848 Prospect Ave.	76	2.00-2.50	3.50- 4.50		
CLARENDON St. Clair Ave. & Ontario	50			1.25-1.50	2.00-2.50
CLEVELAND Superior Ave., Public Square	1000	3.00-7.00	4.50-10.00		
COLONIAL 523 Prospect Ave., S. E.	150	2.50-3.50	4.00- 5.00	2.00-2.50	3.00-3.50
DOANBROOKE (Apts.) E. 105th at Euclid Ave.	122	2.50-7.50	4.00-10.00		
EUCLID Euclid Ave. at E. 14th St.	200	2.50-3.50	4.00- 6.00	1.50-3.00	2.50-4.00
GILLSY 1811 E. 9th St.	350	2.00-	3.00- 4.00	1.50-	2.50-3.00
HOLLENDEN Superior Ave. at E. 6th St.	800	3.00-6.00	5.00- 8.00		
MECCA 1862 E. 9th St.	120	1.50-2.00	3.00-	1.50-	
NEW AMSTERDAM Euclid Ave. at E. 22nd St.	350	2.00-	3.50- 4.00		
OLMSTEAD Superior Ave. at E. 9th St.	300	2.00-4.00	4.00- 6.00		
STATLER Euclid Ave. at E. 14th St.	1000	3.00-8.00	4.50-10.00		
TALGARTH 1924 Prospect Ave.	75	1.50-2.50	2.00- 3.50	1.25-1.50	1.75-2.25
WINTON Prospect Ave. at E. 9th St.	600	3.00-5.00	5.00- 8.00		

That all members desiring to attend the Convention may be comfortably housed in hotels in the down town district, the Hotels of Cleveland have been asked to fill each room to its regular capacity. Members, therefore, are requested to procure a roommate or mates wherever possible, and request rooms for groups of 2, 3 or 4 persons.

GENERAL INFORMATION

CLUBS

Cleveland Athletic Club, 1120 Euclid Avenue.

Union Club, 1211 Euclid Avenue.

University Club, 3813 Euclid Avenue.

Y. M. C. A., 2200 Prospect Avenue.

Y. W. C. A., Prospect Avenue and East 18th Street.

Sections have been assigned to individual hotels where all their meetings will be held.

All Headquarters are within five minutes' walk of each other.

Write to hotels direct for information.

SECTION HEADQUARTERS

General Sessions, Public Auditorium.
Operative Dentistry, Cleveland Hotel.
Full Denture Prosthesis, Winton Hotel.
Partial Denture Prosthesis, Winton Hotel.
Oral Surgery, Hollenden Hotel.
Orthodontia, Statler Hotel.
Periodontia, Statler Hotel.
Scientific Research, Public Auditorium.
Mouth Hygiene and Public Instruction, Public Auditorium, (main floor.)
Clinics (except surgical) Public Auditorium.
Exhibit, Public Auditorium.

HOUSING HEADQUARTERS

Official Family, Hollenden Hotel.
Delta Sigma Delta Fraternity, Statler Hotel.
Psi Omega Fraternity, Cleveland Hotel.
Xi Psi Phi Fraternity, Winton Hotel.
Alpha Betta Gamma, Winton Hotel.
Sigma Epsilon Delta, Winton Hotel.

BATH
persons
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